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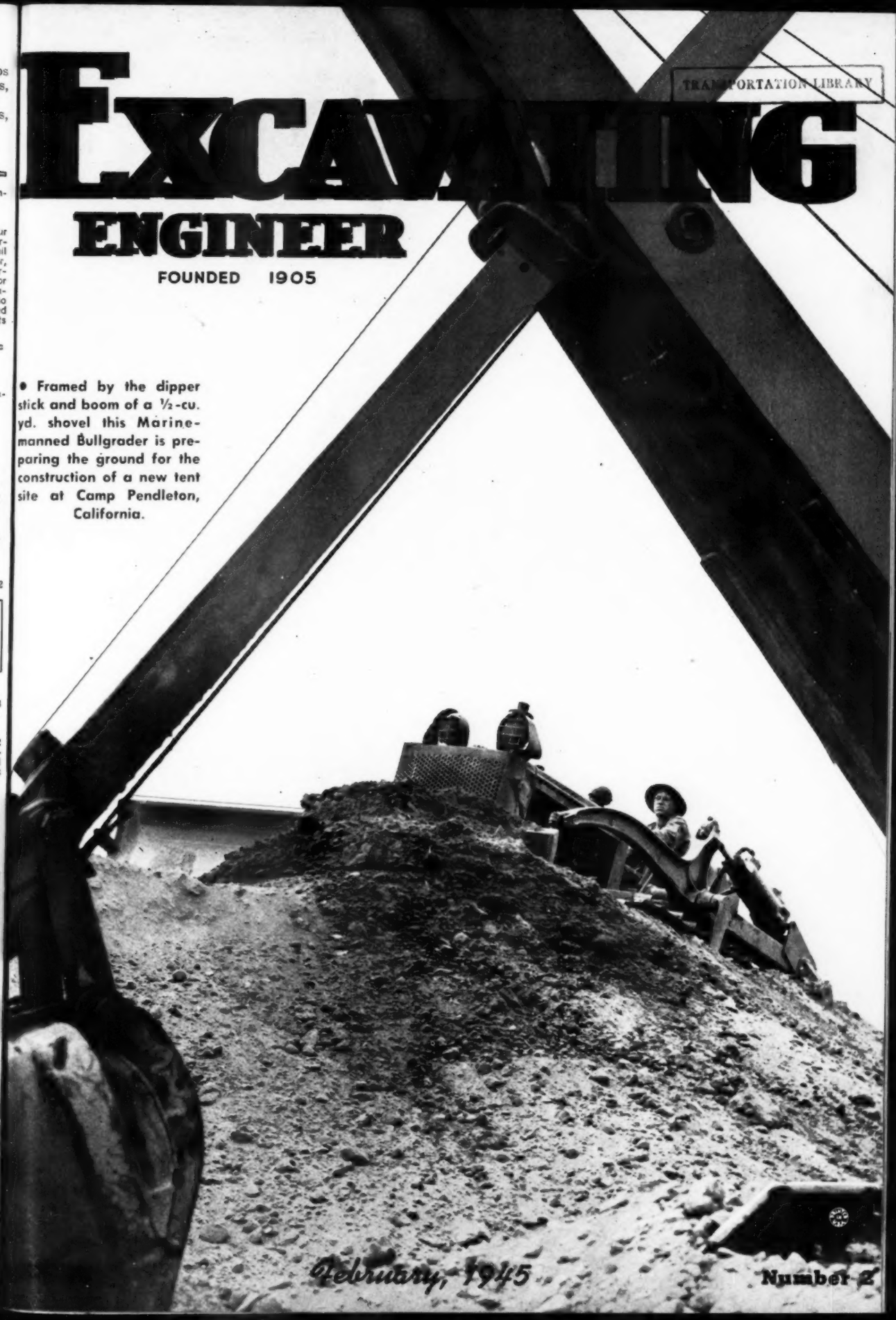

• Framed by the dipper stick and boom of a ½-cu. yd. shovel this Marine-manned Bullgrader is preparing the ground for the construction of a new tent site at Camp Pendleton, California.

February, 1945 Number 2

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CONTENTS

Vol. XXXIX **February, 1945** No. 2

February Advertisers

Allis-Chalmers Mfg. Co. 101
American Chain & Cable Company, Inc. .....3rd Cover
Audel & Company, Theo. 94

Barber-Greene Company 83
Blaw-Knox Company 91
Bucyrus-Erie Company ..2nd Cover, 55, 93, 107, 110
Buda Company, The 103

Caterpillar Tractor Co. 95

Detroit Diesel Engine Division of General Motors Corp..4th Cover

Ensign-Bickford Company, The. 99
Erie Steel Construction Co. ... 92
Euclid Road Machinery Co., The 74

For Sale (Classified) 111, 112

Gar Wood Industries, Inc. 52
Gatke Corporation 78
Goodyear Tire & Rubber Co., The 50

Haiss Manufacturing Co., Inc. George 104
Hayward Company, The 110
Hercules Powder Company, Inc. 61
Hodgman Rubber Company ... 51

Independent Pneumatic Tool Co. 60
Ingersoll-Rand Company 49
International Harvester Co. ... 89

John Co., C. R. 86

Koehring Company 81

LaCrosse Trailer & Equipment Co. 84
Leschen & Sons Rope Co., A. .. 96
LeTourneau, Inc., R. G. 79

Macwhyte Company 73
Milsco Manufacturing Co. 105
M-R-S Manufacturing Co. ...76-77

Northwest Engineering Co. ... 53

Oliver Corporation, The 87
Onan & Sons, D. W. 98
Osgood Company, The 59
Owen Bucket Company, The .. 80

Preformed Wire Rope 54

Rodgers Hydraulic, Inc. 58
Roeblina's Sons Co., John A. .. 109
Rogers Brothers Corporation .. 90

Sauerman Brothers, Inc. 88
Sheppard Company, R. H. 91
Shunk Manufacturing Co. 110

Templeton-Kenly & Co. 102

Union Wire Rope Corporation. 56-57
U. S. Treasury Dept. War Bonds 85

Wellman Engineering Co., The. 100
Westinghouse Electric & Mfg. Co. 97

After the Engines Went Home 62
Speedway Wrecking Company salvages grain and cleans up wreckage after fire does an estimated $2,000,000 damage to 150-foot elevator of Rosenbaum Brothers & Co., in Chicago.

Crawler Cranes Aid Piledriving— by R. P. Day 66
Army and Navy Engineers pioneer the successful use of crawler cranes for piledriving on military installations.

Bulldozer Accident Prevention— by Kenneth F. Park 68
Because of the power, weight and nature of work performed by tractors mounted with bulldozers, this equipment falls into the category of a potential accident breeder and thus it is important that bulldozers be used correctly to cut accident rate.

Postwar Road Program Fund Apportionment . 72
Four hundred million of first $500,000,000 not available to states until President proclaims end of war emergency or Congress authorizes its expenditure. Remaining $100,000,000 may be appropriated by Congress immediately and then will be available for financing surveys and plans and purchase of rights-of-way for projects to be immediately constructed.

Field Notes 75
Bench Measures Space Bars for Punching 75
Winter Lubrication of Excavating Machinery ... 75
Installing New Spool of Cable 75
Homemade Lubricator 75
Welding at War 78
Protecting Threads 78
Railroads Solve Drainage Problems 80
Assuring Clean Diesel Fuel 80
Check Groove Diameters 80

Shots from the Firing Line 82
1945 Legislative Highway Outlook in 44 States. 82
Carlson Heads Central Branch of AGC 86
Campbell Heads N. Dakota Contractors Assn... 88
Estimate Oklahoma Needs $15,942,000 88
Advocate Increase in Gas Tax for Road Building 88
Maine's Postwar Projects to Cost $77,316,816 .. 88
Allman Suggests Joint Session of Engineers 90
New York Has Five-year Road Program 90
Suggest Oregon Highway Projects—$350,000,000 92
Seabees Observe Anniversary of Founding 92
Grant Price Increase for Cement in Nine States. 94
Butler Brothers Ore Shipments in 1944 94
1944 Mineral Production in U. S., Alaska 94
Appoint Forester Engineer 102
President Approves Big Flood Control Bill 102
Lubrication Engineers Organize 102
Perry Ford Succeeds Sours in Ohio 102
Capitol Equipment for Gold Mining 102

Obituaries 104
George S. Whyte, Charles D. Vail 104

Equipment You Ought to Know About 105
Donaldson Field Test Unit 105
All-Purpose Conveyor 105
Truck Tire 105
Cromate Gaskets 105
Heavy Duty Trailer Hydraulic Brakes 105
Half-yard Shovel 105
Aluminum Mallets and Hammer Faces 105
New Enclosed Combustion Heater 106
Wood and Textile Preservative 106

Not in the Contract 108

Notes from the Manufacturers 110

New Trade Literature 111

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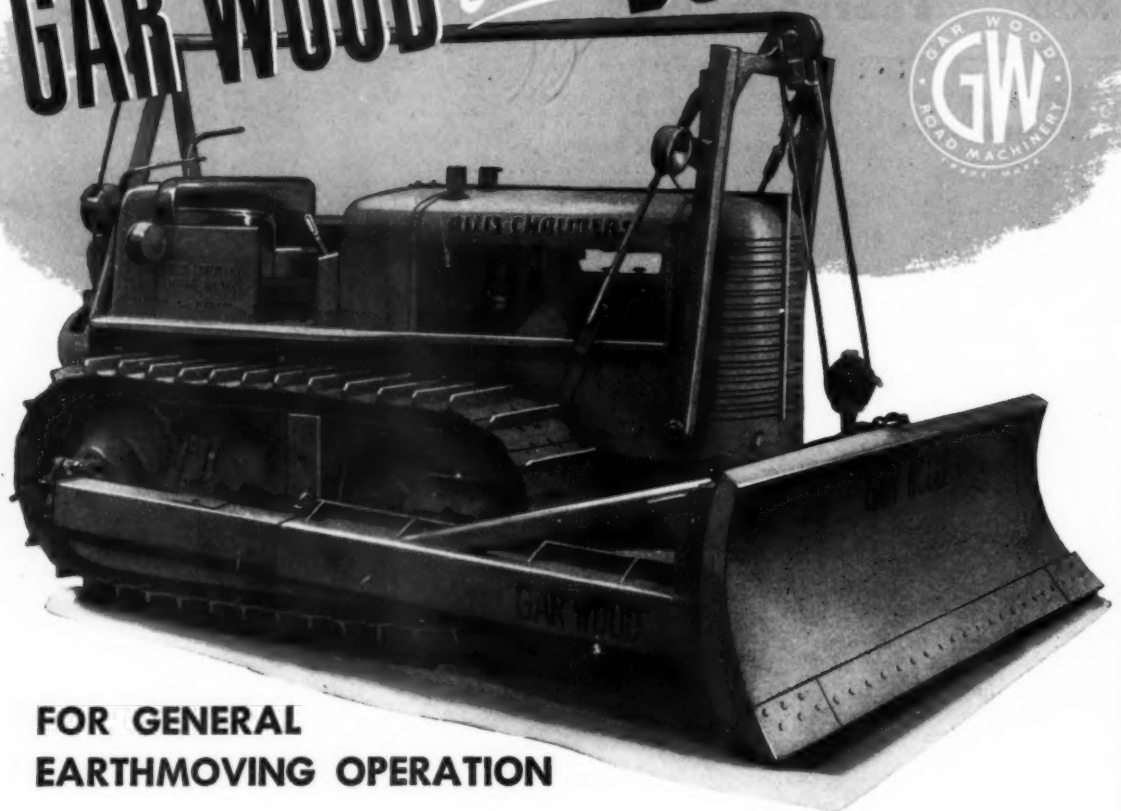

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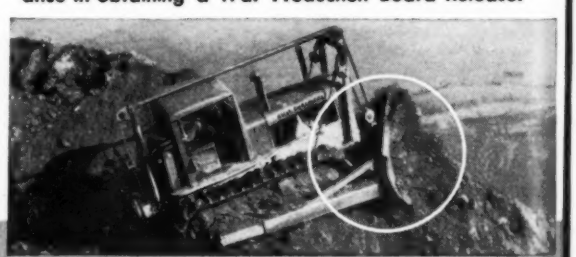

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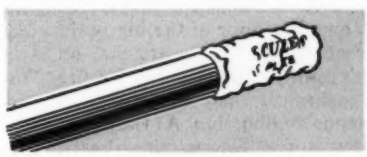
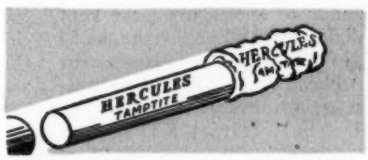


The tamping rod packs the charge snugly in the hole, leaving practically no air space around the dynamite.



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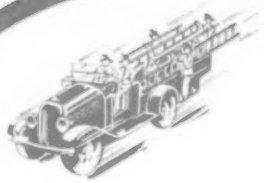
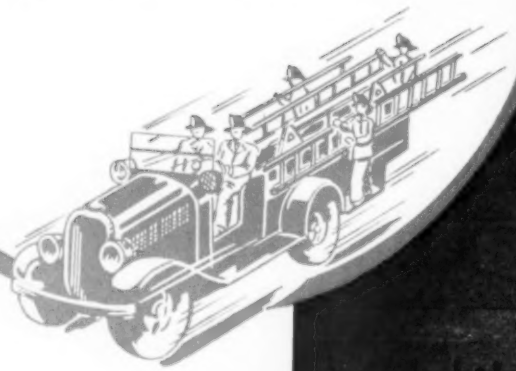


After the Engines Went Home



• It took 54 pieces of emergency fire apparatus to keep the fire at the 10-story belt grain elevator of Rosenbaum Brothers & Co. from spreading as fire raged in a driving snow storm and the east wall of the building blew out. These photos show firemen fighting the blaze.
Top: Chicago Sun Photo Bottom: Acme Photo

Speedway Wrecking Company salvages grain and cleans up wreckage after fire does an estimated $2,000,000 damage to 150-foot elevator of Rosenbaum Brothers & Co., in Chicago.

ON NOVEMBER 29, 1944, three Rosenbaum employees on a top floor of the big grain elevator at 87th and Stewart Sts. on Chicago's south side discovered a fire which apparently had started from spontaneous combustion. As they hurried down a fire escape, they heard several small explosions, and it wasn't long before flames billowed a hundred feet above the structure.

Thousands of spectators were kept at safe distance by 40 policemen, as 54 pieces of fire-fighting equipment worked to keep the blaze from spreading. The seriousness of the danger is shown by the fact that 5-11 and 5-special alarms were sounded. Fire Marshal Anthony J. Mullaney did an excellent job in keeping the blaze from spreading and of handling the spectators. Early estimates indicated that 750,000 bushels of grain, mostly soybeans, valued at $1,500,000 were destroyed or badly damaged and that structural damage to the elevator ran to an additional $500,000. As the fire raged, passenger trains passed safely half a block away on the tracks of the Chicago & Eastern Illinois and the Baltimore & Ohio railroads.

While the flames were still being beaten down by hissing streams of water, plans for salvage were being laid. J. B. Kolko, president of Speedway Wrecking Company was asked to study the situation to see if his company could handle the salvage and clearing jobs. Specialists from Kansas City were called in to classify the damaged grain as to uses which still might be found for it. By December 2, Speedway equipment was on the job, which was divided into three sections: wrecking the unburned part of the elevator, cleaning up the ruins and loading out the damaged grain as directed by the salvage specialist. Fire Marshal Mullaney helped Speedway with his opinions regarding bad wall conditions, etc.

First machines on the job were Bucyrus-Erie 37-B and 22-B Transit cranes which, equipped with long booms and skull crackers broke down the flame-gutted high spots. Later a 44-B with a 1½-cu. yd. Owen clamshell bucket on an 80-foot boom was moved in to load the damaged grain. A 1-cu. yd. Owen clamshell bucket was rigged on the 37-B's 50-foot boom

• Still smoldering 19 days after the fire, timbers hauled from the wreckage are stacked and burned.

for farm feed use was loaded largely to farmers' trucks which drove in for it. Other salvageable classes of grain were classified and loaded in railroad cars. Spotting of these cars was handled by a Caterpillar D7 tractor mounting a LaPlant-Choate bulldozer. Cars were either hauled to position or pushed with the blade, whichever was most convenient.

One of the special problems of the job was getting at water soaked grain in the bottom of the elevator. Sand was pumped in at the bottom to raise the grain to a point where it could be reached by the clamshells.

At the time the job was visited by the writer on December 16, piles of grain and wreckage were still smouldering. As the 44-B moved buckets of grain to get at wrecked timbers, reinforcing steel, etc., smoke puffed lazily from the newly uncovered spots. No estimate could be made then of the length of time that would be required to finish the salvage and clean-up.

No novice at this type of job, Speedway's most recent previous grain fire clean-up started on July 1, 1943, when they moved in on the fire-ruined Norris grainery in Chicago. That job was completed on October 22, 1943. A similar job was also done by Speedway for the Krause Milling Company of Milwaukee following explosions and fire in April, 1937.

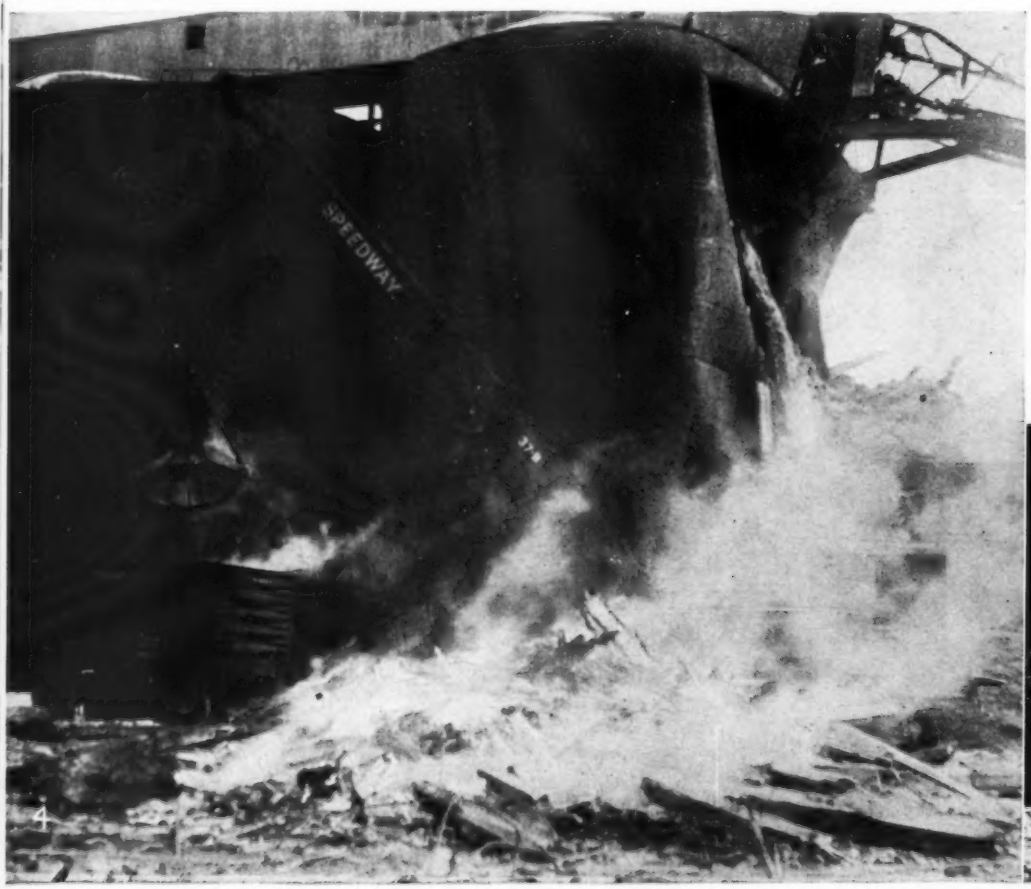
Specialists in wrecking and concrete removal, Speedway has built up a country-wide reputation through its handling of such jobs as removal of concrete structures from the Century of Progress grounds in Chicago, cleaning up a damaged Seagrams distillery in Louisville, Kentucky, wrecking and removing an old Sinclair refining plant in Indiana, high speed removal of old concrete pavement on a main road leading to Chicago's airport, wrecking by thermite of a 1200-ton giant overhead crane at Interlake Iron Co., Chicago. Speedway also recently wrecked the 22-story Capitol Building in Chicago and completed the job in a total of 59 days. The story of one of Speedway's most outstanding jobs cannot yet be told. It involved handling rock excavation, on a subcontract for Great Lakes Dredge & Dock Co., for the MacArthur locks at Sault Ste. Marie. Moving nearly every piece of its equipment to this job, and working 24 hours a day, seven days a week, Speedway handled its part of the work in true American War Effort Style. The entire project was so well done that the prime contractor was awarded the Army-Navy "E" for it. Perhaps

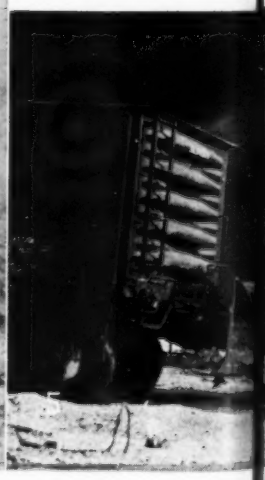
• Bucyrus-Erie 44-B with 1½-cu. yd. Owen clamshell bucket on an 80-ft. boom clears wreckage and loads grain.

o haul timbers from the smouldering reckage.
These timbers were burned on the te; wrecked metal and stone were auled to a dump in Speedway's 6-heel Mack Autocars. Grain suitable

two things are largely responsible for the way in which Speedway Wrecking Company makes the tough jobs look easy. The first and most important is the building up of a skilled organization of specialists. Speedway men, remaining with the company year after year, know how to do their jobs and are experienced in the tough ones. Second, Speedway purchases equipment with ample capacity to handle difficult work day in, day out—and then keeps that equipment in A-1 condition. Painted with the Speedway colors, red and gold, and continually spic-and-span, any piece of their equipment is visual evidence of the outstanding organization owning it.

J. B. Kolko is president of Speedway Wrecking Company. Vice-Presi-





• 1.—Wrecked metal and stone was loaded to 6-wheel Mack Autocars, like the one spotted behind this 1-cu. yd. clamshell, and hauled to a dump. 2.—A 1½-cu. yd. Owen clamshell bucket was used to pull out reinforcing steel. 3.—Two Bucyrus-Erie clamshells attack the wreckage. 4. — Salvage-

dents are Henry Bussey and Bud Ruttenberg. Harry De Young and Milton Ruttenberg are superintendents, Bill Voth, master mechanic and his assistant, Louis Mason deserve much of the credit for the excellent mechanical condition in which all equipment is kept. Roy Ruttenberg and Herman Levine are in charge of the salvage of materials and Morris Friedman is office manager. George Michael is operating the 44-B on the Rosenbaum elevator job, Leo Simmons handles the 37-B controls, and Joe Ligler operates the 22-B which was moved to other work after its early "skull-cracking" on this job. The bulldozer is run by Henry Graefen, and the trucks used at the elevator are chauffered by Pete Bolt, Bill Meyers and Nick Hoeksema.

ble grain was classified and loaded to railroad cars by a Bucyrus-Erie clamshell with 50-ft. boom and 1-cu. yd. Owen bucket. 5. — LaPlant-Choate bulldozer on Caterpillar D-7 tractor spotted the railroad cars. 6.—Speedway's bulldozer was also used for cleaning up operations and worked in a dense smoke.

● Bucyrus-Erie 15-B piledriver puts in palm tree piles for the Seabees in the South Pacific.
Official U. S. Navy Photo

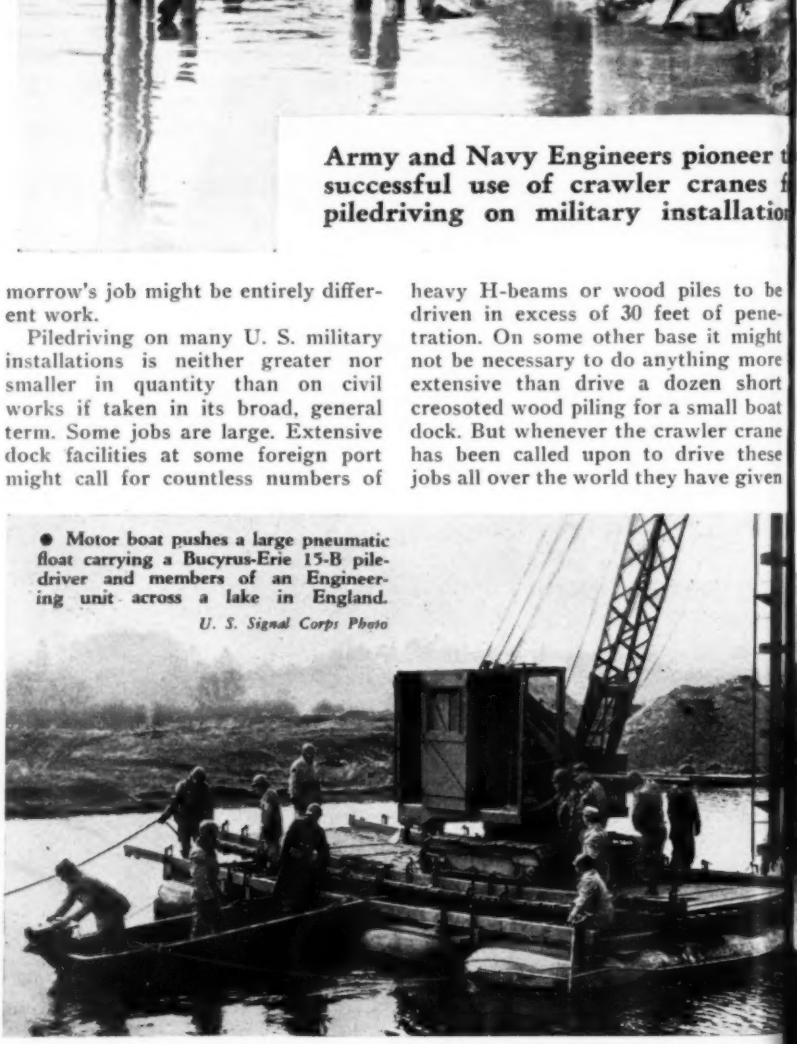
By R. P. DAY

Army and Navy Engineers pioneer t successful use of crawler cranes f piledriving on military installatio

WHEN CRAWLER cranes were first introduced to the pile-driving business a few years ago, many cries went up within that branch of the construction industry that production dropped whenever a crane was used instead of the standard type of piledriver. Only a few characters with enough gray matter under their hard hats to look into the future would do so, and once in a while you could get a grudging kind of admission from these individuals that maybe a crawler crane was okay for short wood piling.

Army and Navy engineers are using the crawler crane so successfully in this type of work that its use on military installations is going to be noticed and studied by successful contractors even more extensively than it has to date. By using the crane with a simple, easily made set of piledriver leads, and compressed air as a source of power for the pile hammer, the cumbersome, hard-to-mobilize piledriver has been replaced successfully. The crawler crane and the air compressor are versatile machines. They might drive a small job here today and move somewhere else tomorrow. Tomorrow's job might be entirely different work.

Piledriving on many U. S. military installations is neither greater nor smaller in quantity than on civil works if taken in its broad, general term. Some jobs are large. Extensive dock facilities at some foreign port might call for countless numbers of heavy H-beams or wood piles to be driven in excess of 30 feet of penetration. On some other base it might not be necessary to do anything more extensive than drive a dozen short creosoted wood piling for a small boat dock. But whenever the crawler crane has been called upon to drive these jobs all over the world they have given



● Motor boat pushes a large pneumatic float carrying a Bucyrus-Erie 15-B piledriver and members of an Engineering unit across a lake in England.
U. S. Signal Corps Photo

a good account of themselves. Bearing piles, MZ or AP type steel sheeting, wood or concrete piles—it makes no difference.

Concrete piles were sometimes a little difficult to handle with anything under a 2½-cu. yd. machine owing to their weight. Several reasons entered into this. Extreme weight overloaded the boom. In the case of an overload the counterbalance weights were not generally adequate and the machine might tip up or overturn.

Early in the game the quality of wire rope was not what it is today, and that made a difference. It is of course possible now to use preformed wire rope on work where long service life and a high factor of safety are desired.

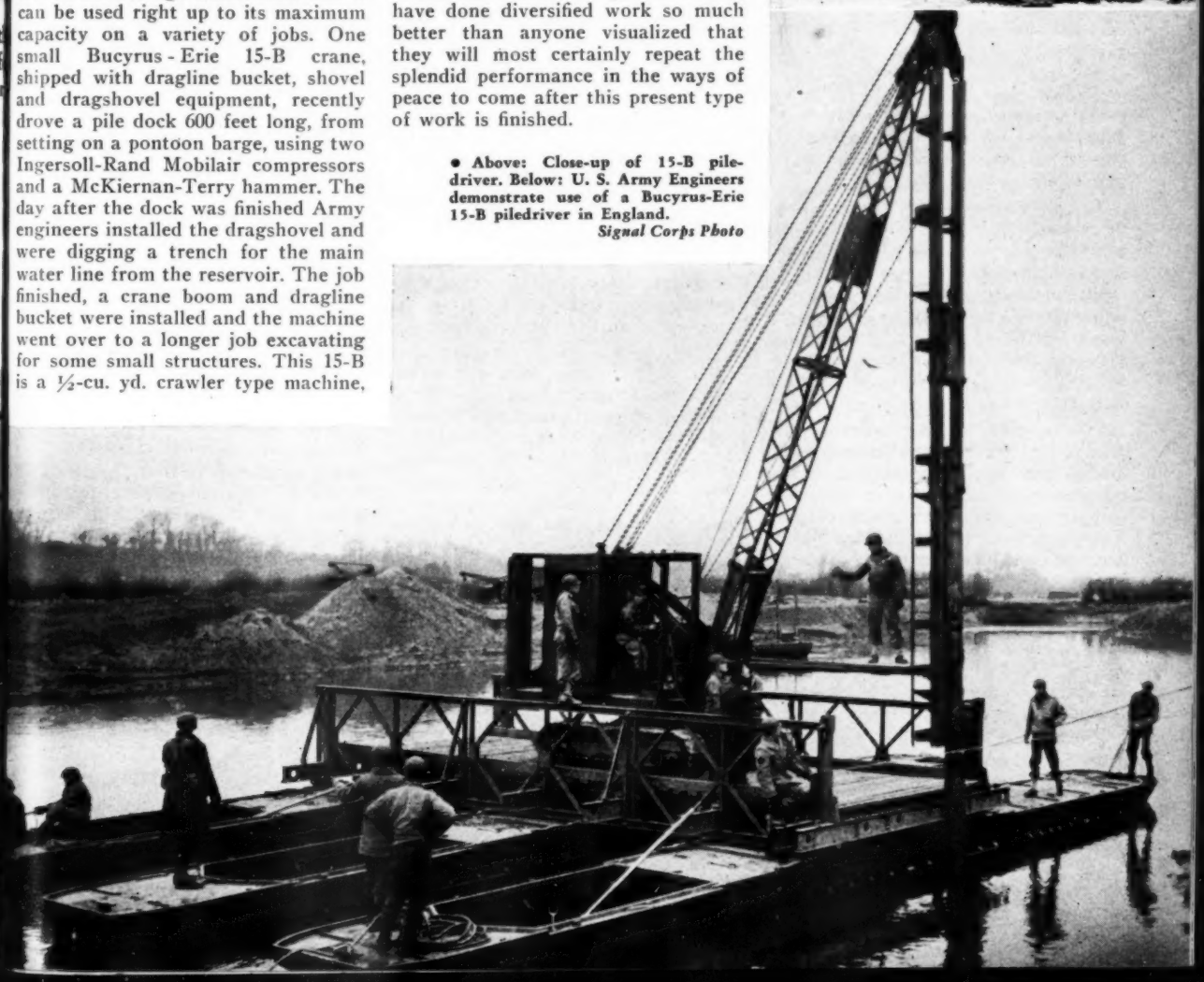
Crane manufacturers install non-preformed rope on new machines. However, many good contractors, as well as the Army and Navy engineers, change to preformed rope. The change pays off in fewer rope changes later, less down time, and fewer hand injuries to the workmen who have to handle it.

Improved boom design and increased stability has so broadened the use of the average small crane that it can be used right up to its maximum capacity on a variety of jobs. One small Bucyrus-Erie 15-B crane, shipped with dragline bucket, shovel and dragshovel equipment, recently drove a pile dock 600 feet long, from setting on a pontoon barge, using two Ingersoll-Rand Mobilair compressors and a McKiernan-Terry hammer. The day after the dock was finished Army engineers installed the dragshovel and were digging a trench for the main water line from the reservoir. The job finished, a crane boom and dragline bucket were installed and the machine went over to a longer job excavating for some small structures. This 15-B is a ½-cu. yd. crawler type machine, and the versatility displayed here makes it popular.

The crawler crane will walk in over soggy ground, and as long as it is not too boggy no pads are necessary. It works in very limited quarters: in places where it would be impractical to put a skid rig and impossible to set slideover lines. It will drive circular cells or batter piles and show a decently high driving quota. It will walk down on a barge and drive marine work efficiently. It is small wonder that wherever the Seabees or the Army have done piledriving the crawler crane has been used exclusively.

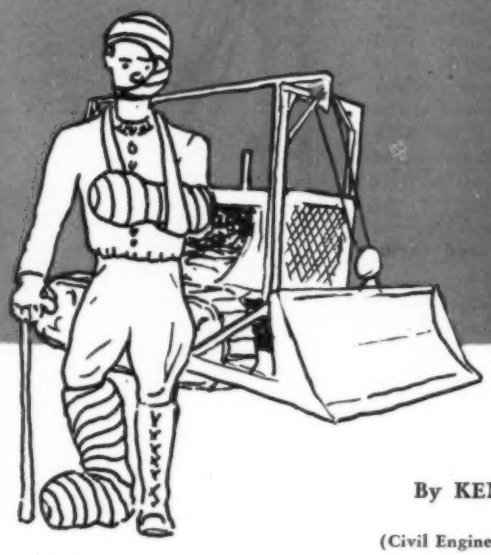
They generally hand the leads on an extra long boom point sheave pin which extends out about four inches beyond either side of the boom frame. This makes for a solid leads, with less whipping, and easier and more accurate spotting. Leads are fabricated from 6"x6" or 8"x8" Douglas fir timbers, well braced, with three landings and a ladder. Sometimes you see a light steel leads, but it's an old timer, made before 1942. In any case, timber leads are easily made and easily moved—and they do the work.

Crawler cranes, to put it briefly, have done diversified work so much better than anyone visualized that they will most certainly repeat the splendid performance in the ways of peace to come after this present type of work is finished.



• Above: Close-up of 15-B piledriver. Below: U. S. Army Engineers demonstrate use of a Bucyrus-Erie 15-B piledriver in England.
Signal Corps Photo

Bulldozer Accident Prevention



Because of the power, weight and nature of work performed by tractors mounted with bulldozers, this equipment falls into the category of a potential accident breeder and thus it is important that bulldozers be used correctly to cut accident rate.

By KENNETH F. PARK

(Civil Engineer, Caterpillar Tractor Co., Peoria, Ill.)

IN THE INDUSTRIES THE practice of safety engineering has become a profession — and constant efforts are made to apply to safety problems all obtainable skill and knowledge. In the field of general construction—and especially in that of extavation—I have never seen a move to prevent accidents carried on as a part of the project.

The benefits of safety measures can be as exacting in field construction, if practiced, and save many losses by no means limited to any machinery particularly insured. Also, many remote and indirect losses such as production losses, increased overhead to remaining production tools, injury to persons—all caused by enforced suspension, can be saved.

The loss due to a personal injury is only a part of the loss the employer actually sustains. Indirect loss, such as excitement caused by an accident, stoppage of that and other work and temporary loss of morale have been demonstrated as amounting to several times the direct loss because of the accident injury—and those collateral losses cannot be insured because of their nature. Insurance companies cannot enforce their safety recommendations, thus their only recourse is upped costs or cancellation.

Excavating contracting unfortunately has no record of accidents. Such statistics as are available rate an industrial classification of "Construction Work" which is presumed to include general excavating but which I doubt fail to report an accurate accident rate for this work and, further, fail to classify the accidents in a manner helpful to their elimination.

Serious Accidents Count

Industry as a whole indicates a distribution of industrial accidents in which less than 1% result in death—about 5% in permanent disability and about 94% in temporary disability. It should be remembered, however, that viewed from the human and economic standpoint, cases of death or permanent disability of high degree are more important than the bulk of minor accidents.

Whether this same ratio applies to general construction and particularly to excavation is a question. The very nature of the work, in which labor handles enormous quantities of power —more than ordinarily heavy machinery—wresting progress from nature itself, tends to make the nature of accidents more serious than those in which small light tools and equipment are handled. The determination of the causes of accidents is a difficult task but each accident is generally the culmination of a long train of events which is ultimately traceable to some failure of human foresight or insight.

The failure of care, attention and skill which underlies the occurrence of the great majority of accidents results from the combined action of numerous factors, one of most importance of which is inexperience.

Carelessness contributes considerably to accidents where workmen who know better, do many of the things they do to invite accidents because of intimacy with danger and laxity in normal preventative measures.

Fatigue plays a part in accident causation when working hours are too long.

Excessive drinking has contributed materially to accidents with a reported liability amounting to over three times that of abstinent workers.

During 1943 the frequency rate in "Construction" is set at 15.39 and the severity at 2.48. The only estimate I have seen covering earth movement is one classified as "Earth Dams." The frequency was given at 32.76 — the severity at 5.13.

Estimates show that between 16,000 and 19,000 persons meet their death annually as a result of occupational injuries of some kind. 18,000 were reported for 1943—with 2,400 charged to "Construction." For "Construction" alone, this is more than the Johnstown Flood took; more than five times as many as died in the San Francisco earthquake and fire.

The direct cost of accidents in industry is placed at from $600,000,000 to $700,000,000 annually. Occupational injuries cost the nation $2,400,000,000 during 1943. Statistics indicate that between 80% and 90% of all industrial accidents are due to unsafe practices, while only 10% to 20% are chargeable to unsafe conditions.

Executives Must Help

Studies of industrial accident prevention work shows that the best results have been obtained in organizations where safety activities, both mechanical and educational, are considered as direct functions of supervision. The degree of success resulting

from safety plans is dependent, in large part, upon the direct personal interest taken in this phase of the operation by the chief executive. To the employees and supervisors he is representative of the company and his interests and activities reflect the policy of the employing organization.

A system for obtaining reliable information relative to each accident and tabulating and utilizing this material is considered essential to a reduction of the accident rate. Accident statistics are generally classified by cause in order to determine their relative importance and to serve as a guide in planning for safety.

A safety policy is a first essential. A means of actively conducting it is a second. This most logically rests with supervision. In the final analysis however, the cause and prevention rests with the individual employee. It is thus essential that he be selected and placed with due consideration to his physical and mental ability to perform his designated duties in a safe manner.

Education against accidents is necessary and the most efficient method provided is by meetings to develop mutual interest between foremen and men. Safety committees serve to place a definite responsibility upon the committee members. A rotation of membership results in reaching an entire force and helps convince them of the importance of any proposed measures.

Leaflets and bulletins placed in prominent spots aid the management in keeping the idea of safety in front of employees at all times.

Bulldozers on Tractors

The crawler tractor has always been a source of great power and weight. Handling it with maximum use has involved placing it in the work of destruction, or salvage, or in spots where heavy things have to be lifted, pushed, pulled, dug up, or turned over, rolled or in some manner mauled around. It thus brings the tractor into the category of a potential accident breeder.

The simple acts of crawling on and off a unit involve the chance of a slip or bruise and cannot be carelessly continued for long without chance of accident. Mounting a tractor while in motion is a particularly bad practice.

Before starting a tractor-bulldozer the precaution of climbing on board, checking the transmission to assure its being out of gear, setting the brakes if on a slope, and seeing that the blade is dropped on the ground are precautions that should be insisted upon.

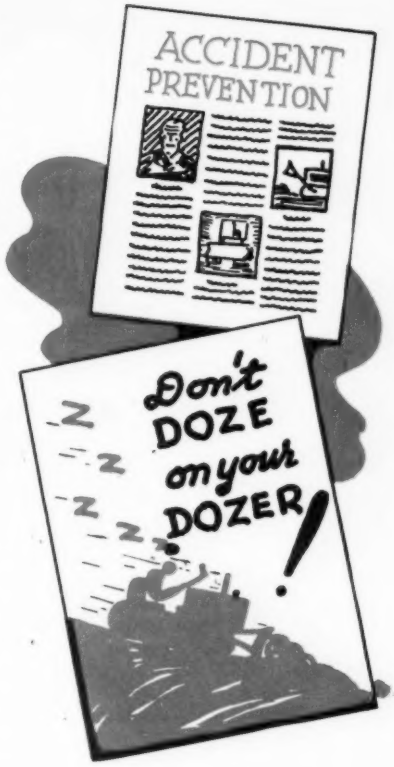
Injuries in cranking a starting engine are in most part due to lack of knowledge in the use of the magneto controls. When an engine is cold the magneto control lever should be placed at advance. Seldom is danger occasioned from a kick-back when the motor is cold, except from possible bruises occasioned by slips.

Further, never crank a starting engine with the thumb under the handle. Place the left hand fingers and thumb over the top of the handle. It should always be pulled toward the operator with the left hand from over the top quarter of the turn — never pushed through the bottom arc. A quarter turn is sufficient to crank the engine. Kick-backs from hot engines without these precautions have resulted in scores of arm and hand injuries, breaks and bruises, and can well be entirely eliminated.

While cranking diesels with starting engines the operator should be well balanced on the track. After the diesel engine has been started, the gasoline tank valve under the hood has to be turned off. This involves the danger of accidental contact with the radiator fan. Shutting off the gasoline valve should be done after the operator is on the tractor rather than from the ground. It is a matter of visibility from the tractor side and a blind reach near the fan from the ground side. Avoid use of gloves during this operation.

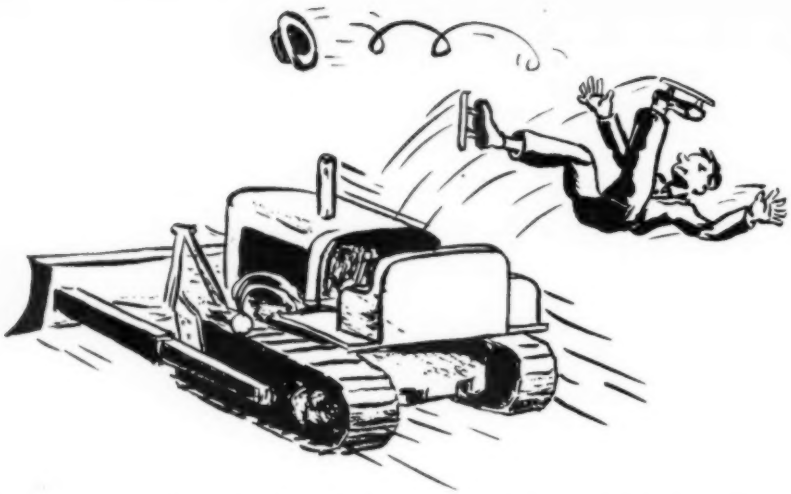
Many of the smaller tractors are cranked by placing a knotted rope in a notch and winding it around the flywheel. After neutralizing all controls stand well balanced with the left hand braced against the fender over the track and give a steady, hard, quick pull of the rope with the right hand. The handle attached to the cranking rope should be held loose enough in the fingers so that it will slip out of the hand if the starting engine backfires.

In mounting a tractor, many slips



• Posters, leaflets and bulletins placed in prominent spots aid the management in the idea of keeping safety in front of employees at all times.

• The excavating industry has no record of accidents. Only available statistics are included in the industrial classification, "Construction Work" which is presumed to include general excavating. The only estimate seen covering earth movement is one classified as, "Earth Dams."



• There should be a ban upon an operator's use of shoes with caulks or heel plates. In the woods, for instance, a spring heel caulked boot on a tractor deck is like a pair of skates on ice.

occur which can be avoided by a little care. There is enough unavoidable chance in a slip occasioned by mud, ice and snow and wet tracks and decks without adding the element of carelessness. The grease monkey or the operator can keep grease clear of decks and tracks.

Iron Shod Shoes Are Dangerous

Also there should be a ban upon the use of iron shod shoes such as those with caulks or heel plates, because the danger of a severe, or even fatal, fall is great. For instance, in the woods a spring heel caulked boot on a tractor deck is like a pair of skates on ice. If an operator in the woods had to leave a tractor because of an imminent upset, or other danger, he'd never get started over steel decks with caulked boots. Of course fatal falls occur but seldom in any one man's life—in fact but once—but his employers, and particularly his widow, will be the only ones to realize such a fact.

In mounting, the operator should place his left foot firmly on the step with the right hand grasping the mounting handle and the left hand on the seat to insure his balance, then raise himself to the tracks.

Having started a tractor and with the operator in the seat, all of his preliminary work and his mounting to the seat has been done on the left side of the machine. Before he starts he should find out what is in front of him, on his right side, and what is in back of him. The operator or any workman should never ride on the tractor anywhere but on the seat.

There is little possibility of danger in tractor movement if the operator is awake. I've known operators to fall asleep and wreck machinery — and themselves. This should be avoided by supervision laying a man off temporarily where the evidence of extreme fatigue, illness or drinking is evident.

In general, bulldozer work is subject to accident to the operator alone, since so much of the work is an individual action. A safety measure well taken is to send operators out in numbers of two or more on a project or have an observer, or swamper, along in case of an accident.

In woods operations, the greatest danger lies in falling branches or timber. In general excavation, from falling material such as overhanging dirt and rocks, or, in clearing, from falling branches. In either case a heavy well-supported arched steel mesh canopy will serve as a protection. Solid tops are primarily a protection from the elements and of course allow no visibility.

In pushing over large live trees, a dead branch or a dead top is a menace, and the only way to use a dozer is to cut the roots on three sides and slowly apply tractor power to the fourth side to push it out. Any abrupt contact with the butt of such a tree may crack it in the middle, or break off a limb that will drop to the tractor top. A completely dead large tree should not be pushed out with a dozer. A long cable should be used to pull it out. No dead snags should be left near pioneer roads where vibration or other means will dislodge them or leave the danger of falling limbs.

On side hill work the operator must know where the material he pushes over the edge is going. Another precaution involves turning on steep slopes. If the ground is covered with snow, pine needles, or rock, a turn should be made on steep ground only with the lower track against a solid stump, tree or rock, to avoid sliding as the tractor comes around parallel to the hill. Make turns if possible with the operator on the up hill side. Logging skinners and pioneer skinners refer to the down hill side of a tractor, or the side of a tractor against the outside edge of a pioneer road, as the "hospital side"—a very good definition.

Slipping Can Be Avoided

Moving a tractor across a steep hillside entails the danger of sliding sidewise. If it is necessary to move across a steep hillside carrying the dozer blade low lowers the center of gravity and somewhat stabilizes the machine.

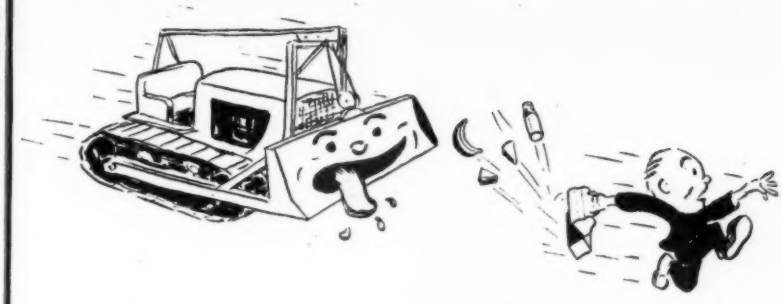
Sliding in itself isn't dangerous, it's the sudden stop which causes the damage. If a tractor sliding sidewise encounters a solid rock or a stump, there is real danger of the machine rolling over.

When a tractor is sliding sideways, there is only one thing to do, and it must be done immediately. Lock the up hill track with the brake, and turn the machine. Get one end or the other up the hill. A tractor sliding "end-o" can be controlled, a tractor sliding sidewise hasn't a chance.

In case of the necessity for riding the tractor down steep slopes, over which the tractor-dozer may start slipping, the blade can be used as a brake unless there is the possibility of ramming into a rock big enough to throw the tractor sideways for a roll, or with the possibilty of leapng thru the arms to turn over.

On level ground a turn to the right is made by releasing the right clutch. The left track walks the tractor around in that direction. On a steep slope the release of the right clutch sends the tractor into a rapid turn to the left. This happens because the right track, freed of all contact with the engine—and thus compression—is forced by weight and gravity to spin free and thus travel the tractor into a "jackknife". I've seen men seriously injured because they forgot this characteristic of clutch steered tractors.

When clearing a dozer should work only in one direction in each area for if a dozer knocks down a stand of small trees in one direction, then turns around and attacks them again from the opposite direction, the blade is not engaging with the butts of the trees, but with their tops. As the dozer pushes against the tops, the trees, if their roots are still caught in the ground, will bend in arcs like a hunting bow and then break and snap back toward the operator. More than one



• Never leave a machine without dropping the bulldozer blade and locking the brake.

operator has "jill poked" himself into the hospital in this manner.

Care Needed in Coupling

Now a word about the man on the ground when coupling a dozer to a rooter or we might state, when coupling a tractor to any piece of equipment. The tractor operator has the safety of the man making the connection entirely in his hands. The operator must back his tractor slowly and gently, in its slowest speed and at half throttle or less. The man on the ground must not attempt to guide the hitch-block into the tractor drawbar jaw with his hands. A stick or bar may be used. Better still, it would be wise to wedge a pebble or stick into the hitch block clevis to hold the hitch block in a horizontal position while the tractor backs into it. Lift the tongue with a jack. Block the wheels so that the machine which is being coupled up cannot move.

When reeving cable, on a drum or through sheaves, the operator must remember to disengage the master clutch, idle the engine and lock the brakes. Kill the engine before working with the cable on a front mounted cable drum. Always handle cable with gloves.

Always kill the engine before attempting to tighten the master clutch. Otherwise a slip of the wrench would throw it into the flywheel.

Never crawl under a bulldozer blade to connect or disconnect a towing cable. Lay the cable on the ground, have the dozer straddle it and have the operator drop the blade, then climb over the blade to hook up—AFTER the operator has taken the tractor out of gear.

Never leave a machine without dropping the bulldozer blade and locking the brake.

After reeving cable through a dozer to the control drum it is the usual practice to spool it. The operator works the control and a helper leads the line to the drum. Many accidents have occurred in this manner, ranging from tearing "whiskered" line through the hands and lacerating them, to drawing the hand under the line on the drum and crushing hands and fingers. Both men must use extra precaution when reeving cable. The tractor operator must wind on the cable slowly and without jerks and the man on the ground must change his hold on the cable frequently. He must also stay as far away from the sheaves or drums as possible so that a jerk wouldn't carry him into the machine.

A worthwhile precaution on the part of the operator is to engage the control clutch with the master clutch out and then engage the master clutch for turning the control drum. A much steadier, slower and better action can thus be obtained because then the master clutch can be "slipped."

The ground man, instead of grasping the line with his hands, with gloves, or with a rag can straighten the line back as far from the tractor as possible, then throw a loop around a stick and grasping the stick at each end allow the cable to travel over it to the drum. Any jerk will merely take the stick out of his hands, eliminating the possibility of burning, cutting, or other injuries.

• In general excavation the greatest danger comes from falling material — such as overhanging dirt and rocks. A heavy well-supported arch steel mesh canopy will serve as a protection.

Fund Apportionment

Four hundred million of first $500,000,000 not available to states until President proclaims end of war emergency or Congress authorizes its expenditure. Remaining $100,000,000 may be appropriated by Congress immediately and then will be available for financing surveys and plans and purchase of rights-of-way for projects to be immediately constructed.

APPORTIONMENT OF THE first $500,000,000 of the $1,500,000,000 authorized by Congress for the most all-embracing road construction program ever undertaken by the Federal government in cooperation with the states has been announced by Major General Philip B. Fleming, Federal Works Administrator.

The far-flung construction plan, under which the states initiate both urban and rural projects, with the Federal government participating generally on a dollar-for-dollar matching basis, was enacted to remove city traffic bottlenecks, connect the principal cities with express highways, give the farmer better roads and to offer jobs immediately after the war.

Four hundred million of the $500,000,000 will not be available to the 48 states, the District of Columbia, Hawaii and Puerto Rico, which share the fund, until the President proclaims the end of the war emergency, or the Senate and House adopt a concurrent resolution authorizing its expenditure. The remaining $100,000,000, under the terms of the Federal-Aid Highway Act of 1944, signed by the President last December 20, may be appropriated by Congress immediately and will then be available for financing surveys and plans and construction, and for the purchase of rights-of-way for projects to be immediately constructed. The first fiscal postwar year is defined as that which ends on June 30 following the ending of the war emergency.

The Act provides that the $500,000,000 be apportioned as follows:

APPORTIONMENT OF FIRST $500,000,000 OF $1,500,000,000 IN ACCORDANCE WITH THE FEDERAL-AID HIGHWAY ACT OF 1944

STATE	Federal-Aid Highway System	Secondary or Feeder Roads	Urban Highways	Total
Alabama	$ 4,711,985	$ 3,732,285	$ 1,303,288	$ 9,747,55
Arizona	3,231,050	2,234,825	262,168	5,728,04
Arkansas	3,854,270	3,103,100	558,221	7,515,59
California	9,018,749	5,162,254	8,122,233	22,303,23
Colorado	4,039,595	2,718,345	933,647	7,691,58
Connecticut	1,395,343	766,175	2,607,495	4,769,01
Delaware	1,096,875	731,250	204,057	2,032,18
Florida	3,236,627	2,168,089	1,599,641	7,004,35
Georgia	5,648,564	4,310,453	1,622,008	11,581,02
Idaho	2,785,964	1,948,442	211,799	4,946,20
Illinois	8,847,357	4,761,820	9,510,696	23,119,87
Indiana	5,402,363	3,622,366	3,065,734	12,090,46
Iowa	5,567,260	3,979,710	1,592,107	11,139,07
Kansas	5,660,742	3,973,471	1,107,219	10,741,43
Kentucky	4,203,011	3,405,116	1,299,529	8,907,65
Louisiana	3,371,110	2,524,469	1,531,578	7,427,15
Maine	1,948,954	1,404,017	560,538	3,913,50
Maryland	1,830,936	1,170,515	1,790,081	4,791,53
Massachusetts	2,942,968	786,683	6,612,615	10,342,26
Michigan	6,826,974	4,129,025	5,682,433	16,638,43
Minnesota	6,055,101	4,170,973	2,206,152	12,432,22
Mississippi	4,041,077	3,333,877	600,115	7,975,06
Missouri	6,660,223	4,562,550	3,151,158	14,373,93
Montana	4,547,996	3,107,277	307,665	7,962,93
Nebraska	4,476,165	3,159,246	782,776	8,418,18
Nevada	2,868,043	1,921,867	60,613	4,850,52
New Hampshire	1,096,875	731,250	475,000	2,303,12
New Jersey	2,863,970	1,041,395	5,527,987	9,433,35
New Mexico	3,636,969	2,517,619	257,261	6,411,84
New York	10,840,121	4,275,825	18,776,072	33,892,01
North Carolina	5,433,060	4,453,613	1,492,475	11,379,14
North Dakota	3,347,724	2,412,044	214,578	5,974,34
Ohio	7,904,748	4,657,668	7,539,574	20,101,99
Oklahoma	5,070,405	3,723,761	1,348,164	10,142,33
Oregon	3,728,908	2,544,582	810,873	7,084,36
Pennsylvania	9,185,473	5,270,332	10,517,201	24,973,00
Rhode Island	1,096,875	731,250	1,123,049	2,951,17
South Carolina	3,050,328	2,518,039	654,032	6,222,39
South Dakota	3,535,472	2,515,992	222,116	6,273,58
Tennessee	4,768,902	3,668,429	1,593,037	10,030,36
Texas	14,258,270	10,043,311	4,464,068	28,765,64
Utah	2,531,450	1,685,875	433,731	4,651,05
Vermont	1,096,875	731,250	211,884	2,040,00
Virginia	4,114,033	3,191,318	1,491,272	8,796,62
Washington	3,536,808	2,394,765	1,467,429	7,399,00
West Virginia	2,474,035	2,080,317	807,692	5,362,04
Wisconsin	5,434,891	3,681,127	2,654,468	11,770,48
Wyoming	2,795,630	1,897,080	133,049	4,825,75
Hawaii	1,096,875	731,250	393,416	2,221,54
District of Columbia	1,096,875	731,250	1,146,477	2,974,60
Puerto Rico	1,110,126	1,132,458	834,529	3,077,11

• Scenes like this one of the digging of an approach to the Pennsylvania Turnpike will be re-enacted in all parts of the country when postwar road construction plans now being formulated are put into operation.

$225,000,000 for the Federal-Aid Highway System, apportioned on a basis of one-third in proportion to area, one-third in proportion to population and one-third in proportion to mileage of rural free delivery and star routes.

$150,000,000 for secondary or feeder roads, apportioned on the same formula as the funds for the Federal-Aid System except rural population, which includes the population of places of less than 2,500, is substituted for total population.

$125,000,000 for the Federal-Aid Highway System in urban areas, apportioned in proportion to population in urban places of 5,000 or more.

Commissioner Thomas H. MacDonald, of the Public Roads Administration of the Federal Works Agency, said the PRA is ready to receive pro-

(Continued on page 106)

Field NOTES

Bench Measures Space Bars for Punching

Spacing bars for reinforcing caging, used in concrete water pipe for a city project, were punched at regular intervals by the use of a notched channel-bench leading from the punch press, at the Denver plant of the Lock Joint Pipe Company. As the bar came through the machine a short handle, with a cross-piece for handhold was fastened to the end. Each time the handhold slipped into a notch a hole was punched at the machine, giving a regular spacing.

By Jos. C. Coyle.

• Bench measures space bars for punching.

Winter Lubrication of Excavating Machinery

Trouble-free operation in wintertime can be assured (when coupled with proper maintenance) if every point of lubrication on heavy excavating machinery is given constant attention. Each and every one of the following points is of importance; each and every one religiously adhered to will insure continuous all-winter operation.

(1) Make sure winter lubricants are used everywhere; start using them as soon as cold weather arrives; don't wait until the supply of old summer lubricants is used up.

(2) Be certain all lubrication channels are kept open, that the feed of lubricant to bearings, gear teeth, etc., is unimpaired.

(3) Don't guess at winter lubrication . . . use the right lubricant every time and if you're not sure check up and find out which is the right one.

(4) Where high speed operation is used on a machine make certain the oil cooling system is in operation in order that the oil may be kept at the proper temperature all of the time.

(5) Where oil settling tanks may be in use on stationary equipment to reduce the load on purifiers and filters, make certain that lines are kept clear and that there is no chance of water freezing therein.

(6) Check oil filters or centrifuges frequently in winter-time when they can most easily become inefficient.

(7) Make sure bearing seals and sealing materials in use are of a nature that will not deteriorate at temperature extremes.

(8) Have gears in most frequent use checked periodically to make certain the gear tooth surfaces remain finished to a state that will promote the maximum cushioning effect of the new winter lubricant.

(9) Make sure the lubricant in use can expand freely with the increases in temperature it will have to absorb from the time of storage or remaining in idleness during winter to the high operating temperatures it will have to combat when in use under actual operating conditions on machinery.

(10) When lubricant is being supplied make sure there is no over-lubrication which is a waste at any time and unsafe in winter-time for it may cause seals to leak.

(11) Check the speed, pressure, temperature and moisture of every machine before the lubricant to be used is selected. These conditions may vary in different types of machinery, therefore it is not always wise to use one lubricant on all types on all kinds of jobs.

(12) Cooling and reconditioning units and their capacities should be checked weekly, for if allowed to deteriorate they may cause the oil in a circulating system to be overworked or insufficiently cooled before reusage.

(13) Store carefully . . . that's always a good rule with all types of lubricants . . . and particularly so in winter. Check your storage facilities with the lubricant salesman and make certain they are right for your climate, your equipment and the conditions and types of lubricants being stored.

(14) Never permit carelessness in lubricant handling. Sometimes this occurs when lubricants are being brought from a storage room to the machine. Lubricants are almost useless when contaminated by dirt or corrosive materials.

(15) Make each machine operator responsible for the lubrication of his piece of equipment.

By E. W. Fair.

Installing New Spool of Cable

A time-saving idea for easy rethreading when the time comes to install a new spool of cable is offered by F. Blaine Amsberry and is reprinted from "The Co-operator."

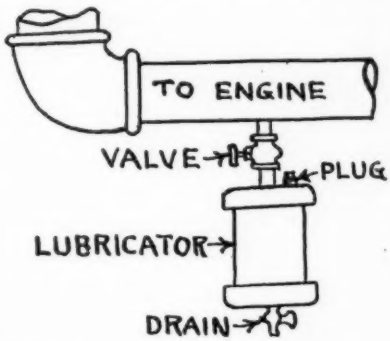
"Peel off two strands of the new cable back two feet. Cut all but two

strands back two feet on the old cable. Splice the two together and tape the ends well to keep from unravelling. Now the cable can be rethreaded, saving time and temper. It is best to keep as much strain off the splice as possible while re-threading."

Homemade Lubricator

For emergency service you can make a surprisingly good lubricator out of ordinary pipe fittings—a lubricator that will actually "work." It won't "freeze" like some of the old lubricators with which I have had experience.

The accompanying sketch shows plainly how to make this lubricator—out of two small nipples, one large nipple (marked "lubricator"), a valve, a drain cock, two caps, and a plug.

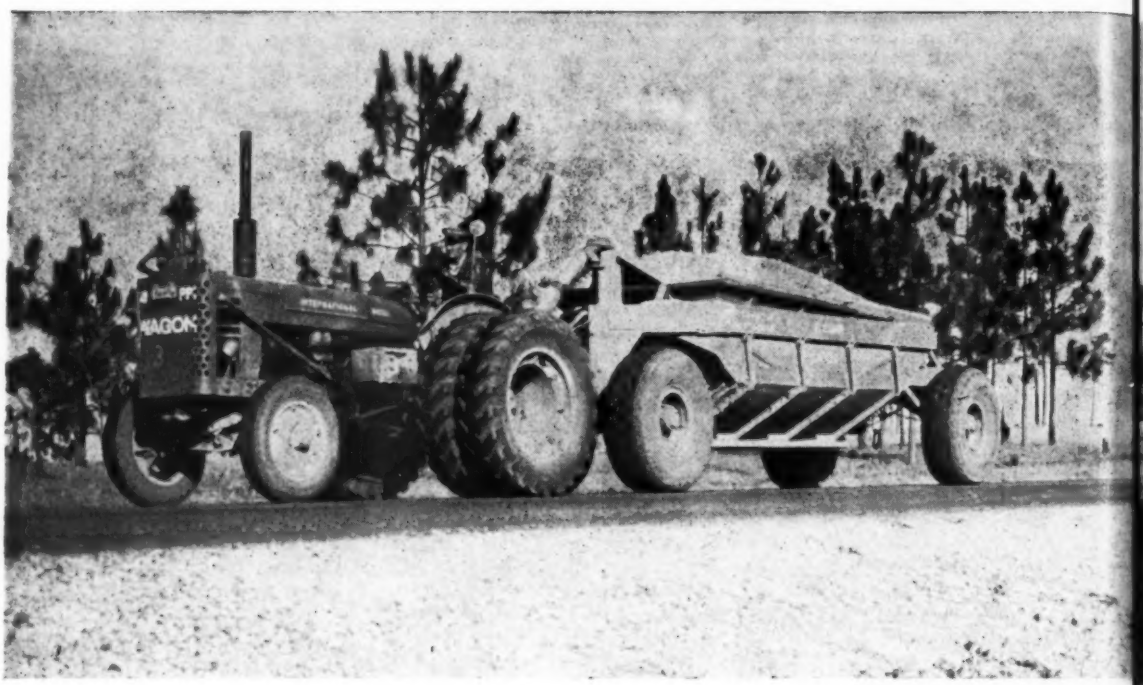


Suit yourself as to sizes. Put them together as shown making everything steam tight, and your lubricator is complete.

Fill the lubricator with cylinder oil through the plug and then replace the plug. Open the valve. Condensate will settle down beneath the oil because water is heavier than oil. The oil will then be lifted up by the condensate and will gradually flow out into the steam pipe and to the engine, pump, or whatever it is that you wish to lubricate. The rate of flow of the

(Continued on page 78)

Record Shows Mississippi Wagons Ha



MISSISSIPPI WAGO

VETERAN LOUISIANA HAULING CONTRACTOR FIRST TRIED THREE MISSISSIPPI WAGONS . . . LATER ADDED 9 MORE . . . NOW CITES LOW COST RECORD OF 12 UNITS

Griffin & Stewart, Lake Charles, La., have been in the contract-haul business for 20 years. Several months ago, this firm purchased, through our dealer Dunham-Pugh Company at Baton Rouge, La., their first MISSISSIPPI WAGONS, buying three units. After thoroughly testing them on long and short gravel hauls, they were so well pleased with the performance of MISSISSIPPI WAGONS they secured nine more; their plans now call for six more units, or **a total of eighteen MISSISSIPPI WAGONS.**

Currently, the 12 MISSISSIPPI WAGONS are hauling gravel 25 miles, one way, or 50 miles, round trip, on a job between Leesville and Alexandria, La. Here is the record of these units, as certified by Griffin & Stewart:

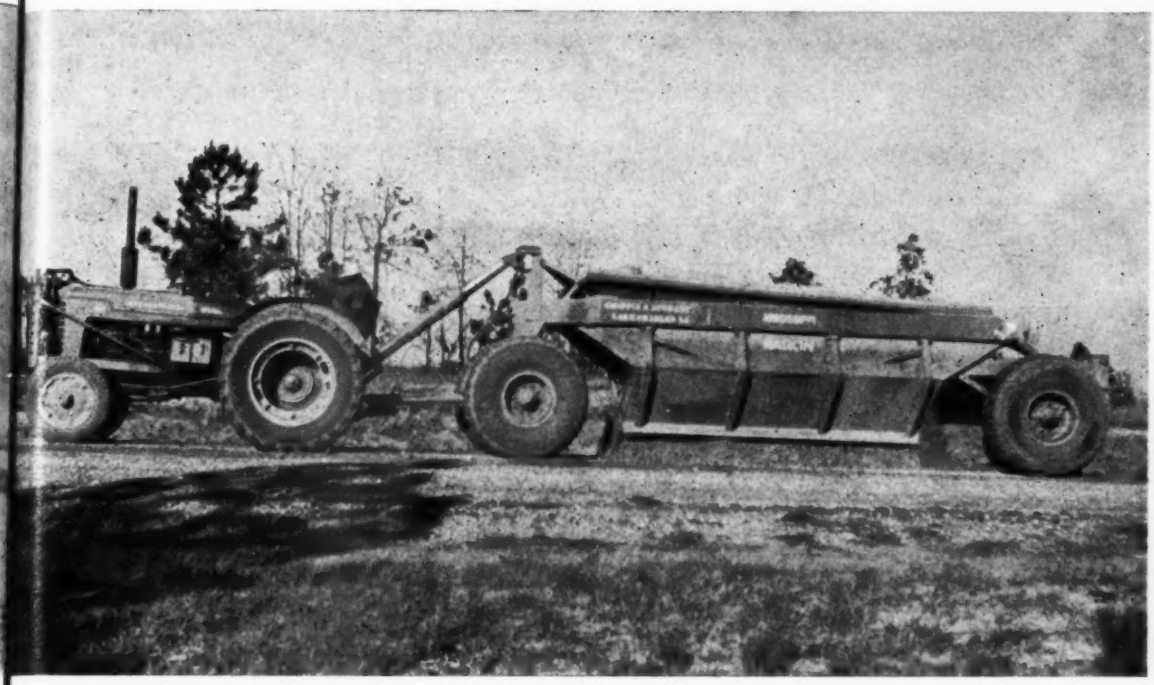
Each MISSISSIPPI WAGON averages a round trip, 50 miles, every three hours, including loading time, or three trips in nine hours. Each unit hauls 10 full yards of gravel per trip, or 30 yards per day. Average consumption of Diesel fuel per trip is 10 gallons, or 30 gallons each 9 hours.

Setting aside for each 9 hours, $11.25 for operator, $4.50 for fuel, $4.50 for repairs and tires, $3.24 for depreciation on tractor, $2.00 for depreciation on trailer, and 45c for oil and grease, each unit hauls 30 yards of gravel for only $25.94.

Hauling 30 yards of gravel 25 miles for $25.94 is slightly less than 3.5c per yard mile.

We cite this record as concrete evidence that the MISSISSIPPI WAGON is a most economical hauling unit, and we are glad to point to this job as an example of how you can depend upon MISSISSIPPI WAGONS to make money for you in the tough postwar period on long or short hauls.

Haravel 25 Miles For 3.5c Per Yard Mile



n Near Leesville, La.

SAYS MISSISSIPPI WAGONS "WILL PAY ALL EXPENSES, INCLUDING DRIVERS COSTS, AND PAY FOR THEMSELVES IN 2000 HOURS OPERATION"

In summing up the desirable qualities OF MISSISSIPPI WAGONS, Mr. Griffin makes this statement:

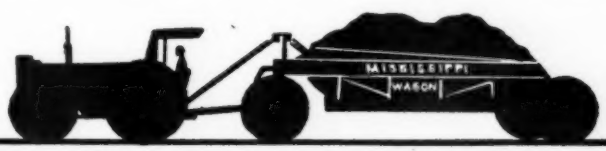
"If a gravel haul contractor operates a MISSISSIPPI WAGON under normal conditions for 2000 hours (about 15 per cent of its normal life), he should clear enough, above operating expenses and repairs, to completely pay for the entire unit. We know of no other hauling equipment about which we can make that statement."

Our Louisiana haul is "normal", seven miles of blacktop and 18 miles of gravel and dirt hills. The weight transfer feature, found ONLY on MISSISSIPPI WAGONS, will keep repairs to a minimum, since it prevents the vicious pounding and surging of the trailer unit on the tractor while operating at high speed, but provides the needed weight for extra traction when the going is slippery or climbing steep grades.

GET SET NOW!

Prepare for the tough postwar competition by investing in MISSISSIPPI WAGONS —

"THE WORLD'S MOST MODERN HAULING UNIT."



MRS MANUFACTURING CO.

JACKSON, MISSISSIPPI

(Continued from page 75)

oil is readily adjusted by means of the valve.

The proper rate of feeding can be determined by occasionally draining out the water and refilling with oil. After a while you will get the "hang" of it and will know just how much to open the valve, how often to refill with oil, and so forth. At first it will be necessary to do some experimenting to determine the best valve setting. Keep tab on where you open it during each experiment. You will soon hit on the right spot.

W. F. Schaphorst

Welding at War

A traveling welding shop, installed in the back end of a 2½-ton truck by a Services of Supply engineer unit is saving valuable time and vital materials on the United States construction jobs in Britain and France.

Shuttling between camp, airdrome, depot and other types of construction projects, its soldier-welders provide expert repair service for power shovels, ditch-diggers, tractors, scrapers, bulldozers, graders, dump trucks, and other construction machinery.

Under the truck's tarpaulin, welding equipment has been assembled into a unit as compact as a kitchen in a modern apartment house. This equipment includes a Hobart arc welder, acetylene generator, drill press, grinder and welding tables and steel work benches full of assorted tools.

Such a shop was not a part of the engineer equipment called for in the Army's table of basic allowances, but this particular shop grew out of a need recognized by Lt. Clyde Fritz of Gypsum, Colorado. He swapped, borrowed and promoted until the collection of equipment was complete. Then he called a couple of the engineer's skilled welders, Sgt. Frank Houhse of Ventura, California, and Corp. Bill Haynes of Tulsa, Oklahoma to assemble the mobile shop. They did the job in less than a week.

Disabled equipment formerly had to be loaded onto a trailer and hauled by a wrecker to a base shop which, in some cases, was 50 to 100 miles away before this mobile welding shop was available. Thus, delays occasioned by the breakdown of vital machinery have been drastically shortened.

The shop is never idle, and does everything from helping to make an ice-cream freezer to rebuilding a sprocket for a tractor. One of its specialties is doing "dental" work on the shovel dippers and ditch-digger scoops whose big teeth become worn by constant digging into rock-strewn and gravel soil of many parts of England and France.

• Lt. Houhse discusses a job on the traveling welding shop.
U. S. Signal Corps Photo

Protecting Threads

When handling heavy pipe mechanically, a common method is to use steel hooks on the ends of the cable, chain, or rope. These hooks are hooked into the ends of the pipe and often result in battered threads. If the pipe is provided with nipples the internal threads of the nipples are almost certain to be battered to some

GATKE SWING FRICTIONS
Speed Operations
Avoid Delays

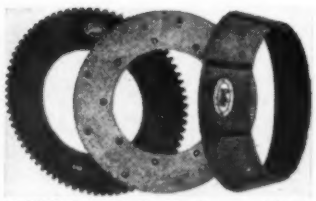
GATKE Improved Swing Friction for a Northwest Shovel. Made for all models.

Recent developments in GATKE Moulded Swing Frictions give a man *plenty extra to work with*—

***TREMENDOUS POWER*—No let down when things get hot.**

***SMOOTH ACTION*—No grabbing or chattering.**

***LONG WEAR LIFE* beyond comparison.**



GATKE Clutch Facings. Made for all Road Building, Excavating and Construction Equipment.

Unless you have Genuine GATKE *Improved* Swing Frictions you are missing plenty! They are *guaranteed* to do the job better and last longer. Use them for your next replacement and *compare results!*

Shipped from stock for popular Shovels, Draglines, etc. Just order by make and model.

If you have problems, *tell us about them.* GATKE has been *licking Tough Jobs for 28 years.*

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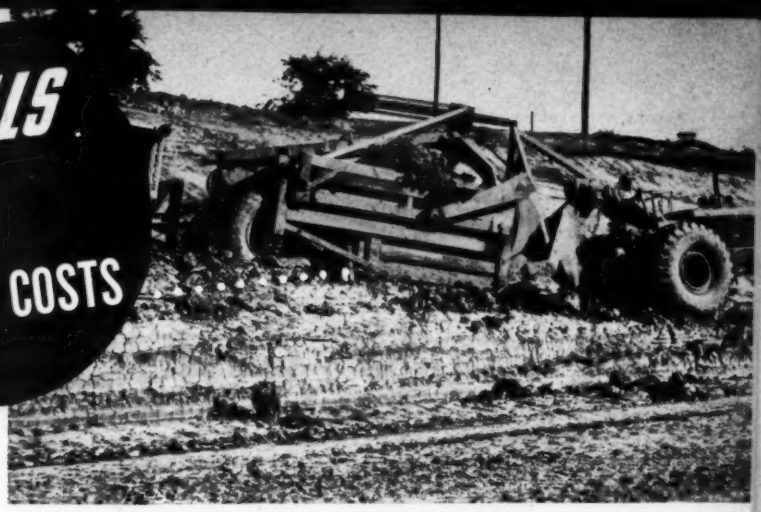
Why TOURNAPULLS SHOW SAVINGS OVER SHOVEL-TRUCK DIRTMOVING COSTS



YOU can't afford to overlook the advantages of Tournapull self-loading over shovel-truck dirt-moving methods. It eliminates the need for shovels in any material suitable for scraper loading, including shale, hardpan, etc., which can be broken with a LeTourneau Rooter. As an excavator, Tournapull gives you these advantages:

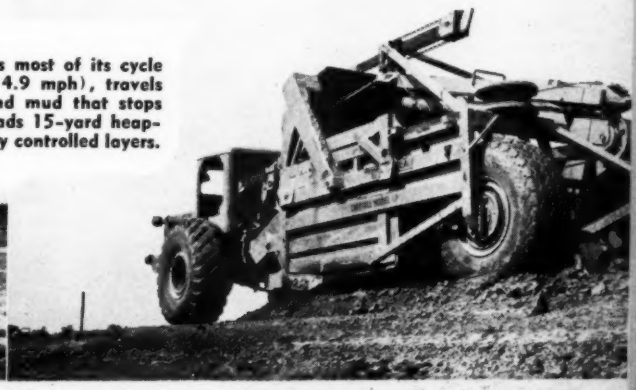
1. It gets heaping loads as efficiently along a shallow cut and at the same low cost as it does on a deep cut.
2. It has greater flexibility in handling the job, is ready to move any yard of top dirt any time you want it . . . it's all pay dirt without rehandling.
3. It eliminates shovel move-ups from one part of your job to another; also, truck-waiting-at-shovel delays.
4. A shovel breakdown ties up the job, a Tournapull breakdown ties up only a single unit, the rest of the fleet goes on working and earning.
5. Tournapulls can move job-to-job under their own power, usually save about half freight costs, plus delay waiting for trailers, flat cars, blocking, switching.

Next, consider the Tournapull simply as a haul unit. It gives you these cost-cutting advantages over one-purpose dump trucks or specialized hauling units:

1. It spreads loads in thin controlled layers for better compaction on the fill.
2. Its big diameter tires (21.00 x 24) make for easier rolling, better flotation, eliminate the problems of duals.
3. Long wheelbase (22') plus the giant, low-pressure tires, provides easy riding for driver and machinery.

Check with your LeTourneau distributor . . . give him the output capacity and length of haul for any given job. Let him show you figures for the Tournapull set-up to handle the same yardage. Compare investment, total weight of equipment, horsepower and operating crew required against your shovel-trucks costs. Do it NOW—it will pay.

Tournapull hauls most of its cycle in high gear (14.9 mph), travels through sand and mud that stops trucks . . . spreads 15-yard heaped loads in evenly controlled layers.



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Manufacturers of TOURNAPULLS*, ANGLEDOZERS*, BULLDOZERS, TILTDOZERS*, CARRYALL* SCRAPERS POWER CONTROL UNITS, ROOTERS*, TOURNATRAILERS*, TOURNACRANES*, TOURNATRUCKS*, SHEEP'S FOOT ROLLERS, TOURNAROPE*, TOURNAWELD*, TOURNALIFTS*. *Trade Mark Reg. U. S. Pat. Off. C4

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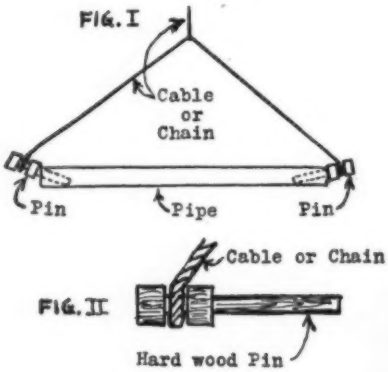
RUBBER • TIRED POWER FOR FASTER EARTHMOVING

extent, and even where the threads are external they are frequently damaged.

Because of the battered threads considerable extra time is consumed by the pipe fitters in making things right, or in forcing the fit.

The accompanying sketch, Fig. I, shows how to avoid this battering. Two hard wood pins, turned as indicated in the detail sketch, Fig. II, will



prevent metal from coming in contact with the threads. Simply insert the ends of the pins into the pipe as shown in Fig. I and let the hoist do the rest. This method is just as quick as with metal hooks, and is certainly preferable.

By W. F. Schaphorst.

Railroads Solve Drainage Problems With Skip-Pipe

Proper drainage is coming in for increasing study and consideration by railroads. In roadbed drainage systems, ground water needs to be run off in a hurry . . . high-drainage capacity is an absolute "must". Men in charge of the construction and maintenance of railroad right-of-ways, switches, spurs, etc., are doing some of this badly-needed work today, despite the present emergency with its acute shortage of manpower and heavy freight demands on all systems.

The Erie, the New York Central, the Pennsylvania, the Atchison, Topeka and Santa Fe, and the Nickel Plate are a few of the railroads that have proceeded with extensive modernization of roadbed drainage.

These roads, along with many other companies, have in Skip-Pipe a recent development of the Clay Pipe industry resulting from joint pioneering by the Robinson Clay Product Company, the W. S. Dickey Clay Manufacturing Co., and the Dimick-Mosher Products Co., the answer to the problem of permanent, fast-flowing sub-surface drainage. They have found that this type of clay pipe is available, never having been on the list of critical materials, and that it affords a low initial expenditure and negligible maintenance costs.

• An installation of Skip-Pipe for platform drainage on the Big Four railroad.

Assuring Clean Diesel Fuel

One of the most important single items in the economical maintenance of any Diesel engine is the use of clean fuel. As the fuel supply nears the bottom of a storage tank it is important to reduce the rate of withdrawal to keep at a minimum the agitation of the sediment which has collected in the bottom of the tank.

Another simple procedure that helps assure a clean fuel supply is to be sure that the connection at the end of the truck discharge hose is clean before the fuel is discharged into the tank. Also it is advisable that engine tanks be filled at the end of a day's work so that condensation will not form in the engine fuel tank and so that the fuel just pumped in can settle overnight. In the morning, just before starting the starting engine, drain a half a pint or so from the cock at the bottom of the fuel tank to draw off any sediment that may have accumulated there while the engine has been idle.

When filling an engine fuel tank from a drum the fuel should always be withdrawn from the drum either by pump or by gravity through a faucet — drums should never be tilted, either on end, or on their side, to pour fuel over the edges for dust and dirt may be washed into the fuel. Furthermore, any sediment which has already settled will again be mixed up with the fuel.

Check Groove Diameters

When installing new rope, it is wise to gauge both the diameter of the rope and the U-groove within the sheaves (and drums if grooved) of the equipment. Grooves should conform to the following tolerances.

SHEAVE GROOVE TOLERANCES
(When rope dead ends)

Nominal Wire Rope Diameter	Tolerances U-Groove Diameter
0 to ¾"	+1/32" to +3/32"
13/16" to 1⅛"	+3/64" to +⅛"
1-3/16" to 1½"	+1/16" to +3/16"
1-9/16" to 2¼"	+3/32" to +¼"
2-5/16" and larger	+⅛" to +5/16"

The above applies where wire ropes dead end. Where the ropes do not dead end (such as on elevators) and the hoisting power is dependent on friction between the rope and the sheave or drum, the minimum tolerances must be from identical size to plus 1/16".

from *Ropeology* published by Macwhyte Company

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Ingenuity in developing amazing portable docks speeded the invasion of Europe. Similarly inbuilt features of design in Owen Buckets speed up the digging and handling capacities of these popular buckets. Buy Owens for resultful operation
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BUCKETS
A MOUTHFUL AT EVERY BITE

205 NEW KOEHRING CRUISER CRANE

Does short odd jobs faster. Gets there quicker — at 5.9 M.P.H. Moves loads faster because it can travel, swing, hoist, raise or lower boom... all at the same time. One-man operation, both working and traveling, cuts labor cost. Hydraulic Steering... Stable Chassis... Eight 12:00 x 20 Tires ...Visibility Unlimited. Approximately 7-ton capacity.

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HEAVY-DUTY CONSTRUCTION EQUIPMENT

Shots from the FIRING LINE

1945 Legislative Highway Outlook in 44 States

Fiscal arrangements for post-war highway rehabilitation and development, constitutional dedication of state highway funds to highway purposes; threats of gasoline and other motor vehicle tax increases; broader motor vehicle reciprocity and more liberal state sizes and weights regulations feature 1945 legislative forecasts from 44 states to the National Highway Users Conference. The effect of many of these proposals would be to make permanent war-time liberalization of restrictive motor vehicle statutes.

Only four states, Kentucky, Louisiana, Mississippi and Virginia have no regular legislative sessions.

Plans for renewed highway development during the biennium covered by most sessions are expected to revolve around the $1,500,000,000 Federal-aid program just approved by Congress for the first three postwar years, although some states report road programs of much longer duration. State highway fund surpluses total approximately $450,000,000 aside from debt obligations with greatest accumulations in such states as Pennsylvania, California, Texas, North Carolina and Virginia.

Dedication of Highway Funds

Legislation to give voters the opportunity of amending their state constitutions to protect highway funds is proposed in 18 states: Alabama, Arkansas, Connecticut, Georgia, Illinois, Indiana, Maryland, Massachusetts, New Mexico, New York, Oklahoma, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, Wisconsin and Wyoming. In some of these states, as well as others, statutory protection of highway funds is being urged as second choice and the need for money to match Federal-aid highway funds is expected to be an additional argument against diversion.

Diversion itself is expected to be a major issue in eight states: Arkansas, Delaware, Illinois, New Jersey, New York, Ohio, Oklahoma and Rhode Island.

More Road Taxes Threatened

Possibilities of increases in gasoline tax rates are reported from 19 states: California, Colorado, Connecticut, Illinois, Iowa, Kansas, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, New Mexico, Ohio, Pennsylvania, Texas, Utah, West Virginia and Wisconsin. Reports of other motor vehicle tax increases come from 15 states: Arkansas, Colorado, Connecticut, Idaho, Illinois, Iowa, Kansas, Michigan, Missouri, Montana, Nebraska, New Mexico, North Dakota, Oklahoma and Texas.

Efforts to increase local sharing of the state motor vehicle taxes are reported from several states.

Other highway matters expected to be prominent in some state legislatures include speed limits, financial responsibility, restoration of diverted revenues to highway funds, increased regulatory control of commercial motor vehicle operators and highway safety legislation.

A detailed state-by-state list of prospective legislative issues as reported to the National Highway Users Conference follows:

Alabama — Anti-diversion constitutional amendment or anti-diversion statute.

Arizona—No important highway legislation reported.

Arkansas—Change in basis of registration fees—trucks and trailers; effort to increase truck and trailer license fees; effort to reduce chauffeurs license fees; diversion taxes to political subdivisions, or through legislative authority to collect taxes; possible mileage tax on for-hire trucks; highway user recommendation of reduction in national highway bill and penalty for diversion; reference Federal-aid; highway user support of reduction of expenses to save for matching Federal-aid; anti-diversion constitutional amendment; diversion of funds to general purposes; diversion by political sub-divisions in their use of highway funds; city sharing of gasoline tax revenue; increase sizes and weights; reciprocity; financial responsibility.

California — Increase state gasoline tax.

Colorado—Increase sizes and weights; increase license fees and gasoline tax.

Connecticut — Increase gasoline and registration taxes; anti-diversion constitutional amendment (up for passage second time); truck license fee reciprocity; increase sizes and weights; compulsory insurance; speed limits; flat $10 registration fee on automobiles; return of $1,000,000 loaned by State Highway Department 12 years ago.

Delaware — Diversion of highway funds.

Florida—Increase sizes and weights; oppose continued diversion; reciprocity.

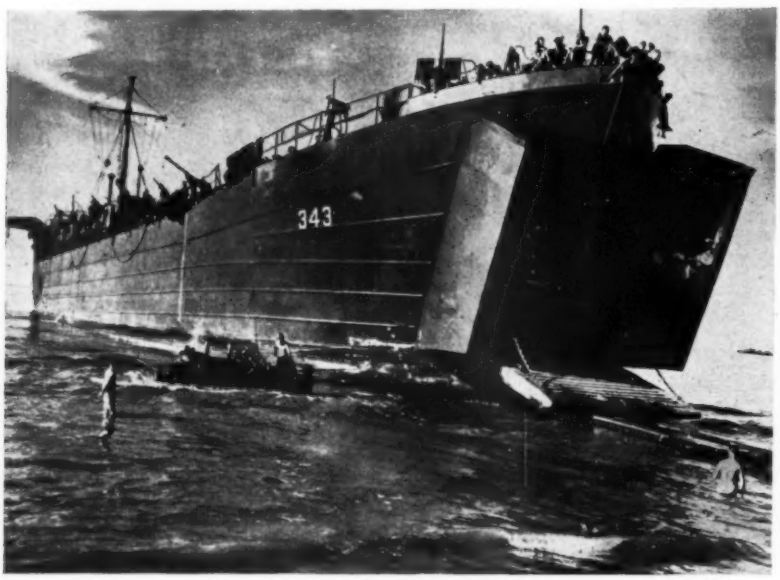
Georgia—Anti-diversion constitutional amendment; bond issues for highways.

Idaho — Reciprocity; increase motor vehicle taxes.

Illinois—Anti-diversion constitutional amendment; diversion; increase sizes and weights; increase tax if sizes and weights increased; increase gasoline tax; increase registration fees; retire highway and relief bonds from general fund.

Indiana—Anti-diversion constitutional amendment; restoration to highway fund of diverted revenues; increase sizes and weights; anti-diversion statute relative to local units of government; limited access road legislation; safety legislation.

Iowa—12-year road building program; increase sizes and weights; reciprocity; increase gasoline and other motor vehicle taxes.



• Called upon by the Seabees to work under all kinds of conditions this TD-18 diesel TracTracTor equipped with a Bucyrus-Erie bulldozer is apparently as much at home in the water as on land as it places landing ramps to facilitate the unloading of an LST.
Navy Photo

How a B-G Bucket Loader Can Save Money *the Year 'Round*

Truck loading time is cut to a minimum by the continuous operation of a Barber-Greene Bucket Loader. But more than that, the B-G Loader has year-round utility . . . can hustle along some construction or maintenance job each season.

★ The B-G Loader yields higher yardage, with less power, less weight, and less cost than any other method.

★ It can effectively handle a variety of loose materials—soil, sand, cinders, gravel or roadway debris.

★ Clean pick-up is assured with the follow-up scraper that cuts to grade and does light excavating.

★ Top performance in stockpile or semi-compacted natural deposit loading, light excavating, shoulder shaping or stripping to grade can be maintained with the 12 selective crowding speeds.

★ By substituting a B-G Snow Loader boom, the B-G Loader can be used for street snow removal.

Ask your B-G representative for details on the versatility and economy of B-G Bucket Loaders. Barber-Greene Company, Aurora, Illinois.

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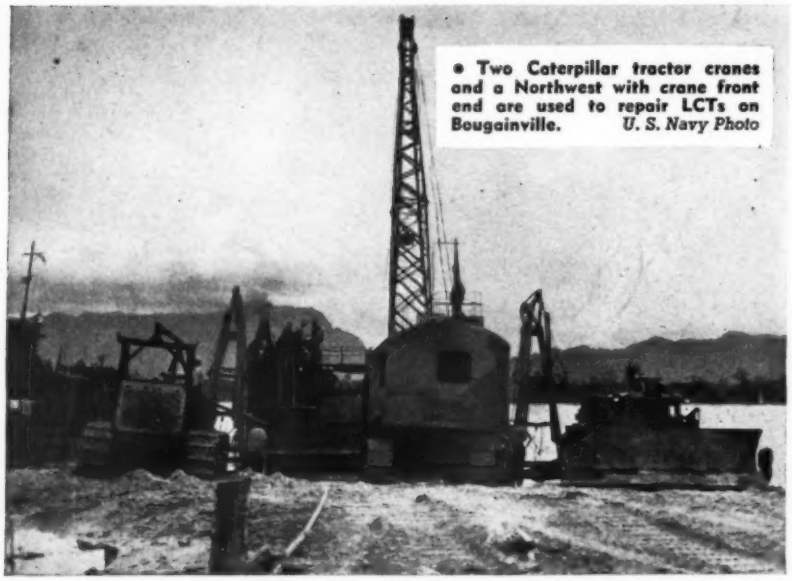
Barber-Greene B G *Constant Flow Equipment*



• Two Caterpillar tractor cranes and a Northwest with crane front end are used to repair LCTs on Bougainville. *U. S. Navy Photo*

Kansas — Increase gasoline tax and registration fees; ton-mile tax.

Kentucky—No regular session.

Louisiana—No regular session.

Maine — Reciprocity; increase sizes and weights; increase rural local roads appropriations.

Maryland — Anti-diversion constitutional amendment or anti-diversion statute; elimination of personal property tax on motor vehicles.

Massachusetts — Anti-diversion constitutional amendment; long - range highway program; make permanent emergency gasoline tax; increase sizes and weights; repeal compulsory insurance law; financial responsibility; April 1 registration date; local sharing of state motor vehicle taxes.

Michigan—Weaken or repeal reciprocity law; increase gasoline tax; increase motor vehicle taxes; appropriations from general fund for highways; allocate revenues from sales tax on motor vehicles to highways; change in distribution of state highway funds to local units.

Minnesota — Increase sizes and weights; reciprocity; increase gasoline tax; reduce Sunday restrictions on trucks; create motor carrier regulatory commission.

Mississippi—No regular session.

Missouri—Reciprocity; increase gasoline tax or motor vehicle taxes.

Montana—Reciprocity; increase gasoline tax and license fees.

Nebraska — Anti-diversion statute; increase gasoline or motor vehicle taxes; repeal port-of-entry law and make "duration" liberalizations permanent; increase sizes and weights.

Nevada—No important legislation reported.

New Hampshire — Reciprocity; increase local sharing of state motor vehicle taxes; revision and modernization of highway laws.

New Jersey—Diversion of highway funds; clarify certificate of title law; legislation permitting Atlantic City to assess 25c fee on each trip made into city by out-of-city motorists.

New Mexico — 2c gasoline tax increase; municipalities to ask authority to tax gasoline; increase motor vehicle license fees; refund highway bonds; anti-diversion constitutional amendment; increase local sharing of state motor vehicle taxes; increase sizes and weights; reciprocity; safety legislation.

New York — Anti-diversion constitutional amendment; diversion of revenue; local sharing of state motor vehicle taxes; $10 registration fee for passenger automobiles.

North Carolina—Repeal statute legalizing diversion in emergencies; increase sizes and weights.

North Dakota — Increase sizes and weights; reduce gasoline tax exemptions; reciprocity; effort to restore diverted highway money to highway fund; increase user taxes.

Ohio—Changes in liquid fuel tax law; diversion; anti-diversion statute; increase gasoline tax; eliminate duplicate sales tax on motor vehicles; make permanent temporary weight increases; appropriate $25,000,000 from general fund to highway fund; flat $10 registration fee for passenger cars.

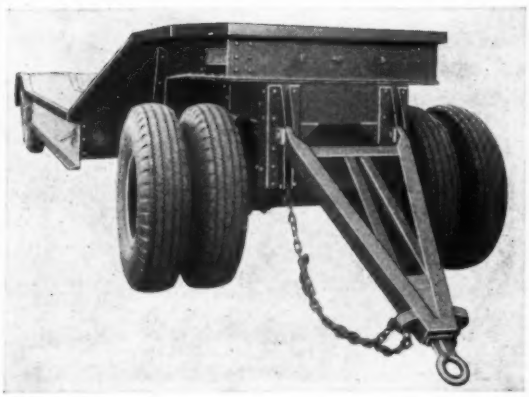
Oklahoma—Efforts to transfer from General Fund to Highway Fund 1c of gasoline tax that has been diverted in past to General Fund; increase motor carrier taxes; municipal efforts to obtain authority to tax truck operations; anti-diversion constitutional amendment or anti-diversion statute; diversion; increase sizes and weights.

Oregon—Increase sizes and weights.

Pennsylvania—Anti-diversion constitutional amendment (up for passage second time); increase gasoline tax; 5-year road building program; repeal 1c emergency gasoline tax; make permanent temporary weight increases; repeal law prohibiting double-deck transportation of autos; refund on farm use

LA CROSSE

OW BOYS



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We can all see with the naked eye that the Payroll Savings Plan provides the most stable method of war financing. Analyze it under the X-ray of sound economics and other important advantages are evident.

A continuous check on inflation, the Payroll Savings Plan helps American Industry to build the economic stability upon which future profits depend. Billions of dollars, invested in War Bonds through this greatest of all savings plans, represent a "high level" market for postwar products. Meanwhile, putting over Payroll Savings Plans *together* establishes a friendlier relationship between management and labor.

To working America the Payroll Savings Plan offers many new and desirable opportunities. Through this systematic "investment in victory," homes, education for their children and nest eggs for their old age are today within the reach of millions.

The benefits of the Payroll Savings Plan to both management and labor are national benefits. Instilling the thrift principle in the mind of the working men and women, the Payroll Savings Plan assures their future security—and is a definite contribution to the prosperity of postwar America!

The Treasury Department acknowledges with appreciation the publication of this message by

Excavating Engineer

This is an official U.S. Treasury advertisement prepared under the auspices of Treasury Department and War Advertising Council.

• **Bucyrus-Erie ½-cu. yd. shovel levels condemned walls in a French city.** *U. S. Signal Corps Photo*

gasoline; increase local sharing of state motor vehicle taxes.

Rhode Island—Anti-diversion constitutional amendment; diversion.

South Carolina — Increase sizes and weights.

South Dakota — Substitute gasoline tax exemptions in place of refunds; decrease gasoline tax; increase sizes and weights.

Tennessee — Anti-diversion constitutional amendment, or anti-diversion statute; increase sizes and weights; reciprocity.

Texas — Limited access roads and other post-war plans; increase gasoline tax; regulation of private motor trucks; outlaw itinerant truckers; anti-diversion constitutional amendment; increase sizes and weights; reciprocity; financial responsibility; gross receipts tax on for-hire carriers; abolish gasoline tax refunds; mileage or wheel tax on for-hire vehicles; increase local sharing of state gasoline tax.

Utah — Anti-diversion constitutional amendment; increase gasoline tax.

Vermont—Increase sizes and weights.

Virginia—No regular session.

Washington—Repay money borrowed from highway fund by general fund.

West Virginia — Re-enact 1c emergency gasoline tax; increase sizes and weights; repeal law prohibiting double-deck transportation of autos; increase money for local roads.

Wisconsin — 10-year highway plan; anti-diversion constitutional amendment or anti-diversion statute; allocate motor carrier fees to highway fund; reciprocity; flat registration fee of $12 for passenger cars; make permanent sizes and weights increases; increase gasoline tax.

Wyoming — Increase sizes and weights; reciprocity; anti-diversion constitutional amendment.

Carlson Heads Central Branch of AGC

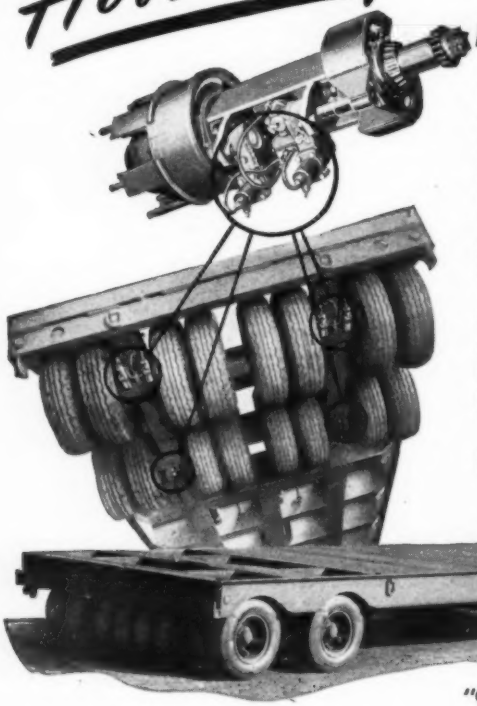
F. H. Carlson of Decorah, Ia., was elected president of the central branch of the Associated General Contractors of America.

R. W. Welden of Iowa Falls, Ia., and Rudolph Weitz of Des Moines were

Here's Why

Jahn Trailers

have faster, smoother braking action



They're equipped with hydraulic brakes which provide the same efficient and safe hydraulic braking action used on trucks and pleasure cars. This new application which was perfected by Jahn engineers assures positive, equal brake pressure on all wheels and consequently smoother, faster braking action. Even when trailers are travelling over very rough terrain there's no possibility of partial application or dragging of the brakes. Safety is increased and maintenance simplified.

Jahn heavy duty trailers are offered in a wide range of sizes from 5 to 100 tons with any axle or wheel combination. Every detail is fabricated with such extreme care and skill that no Jahn trailer has ever failed from carrying its rated capacity load. For the answer to all your heavy duty trailer problems come to "Trailer Headquarters."

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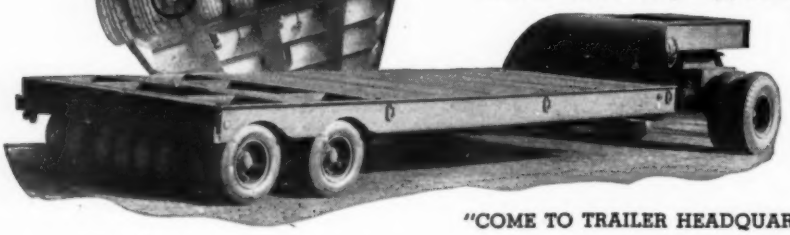

Any Axle or Wheel Combination

JAHN *Heavy Duty* TRAILERS
in Capacities from 5 to 100 TONS

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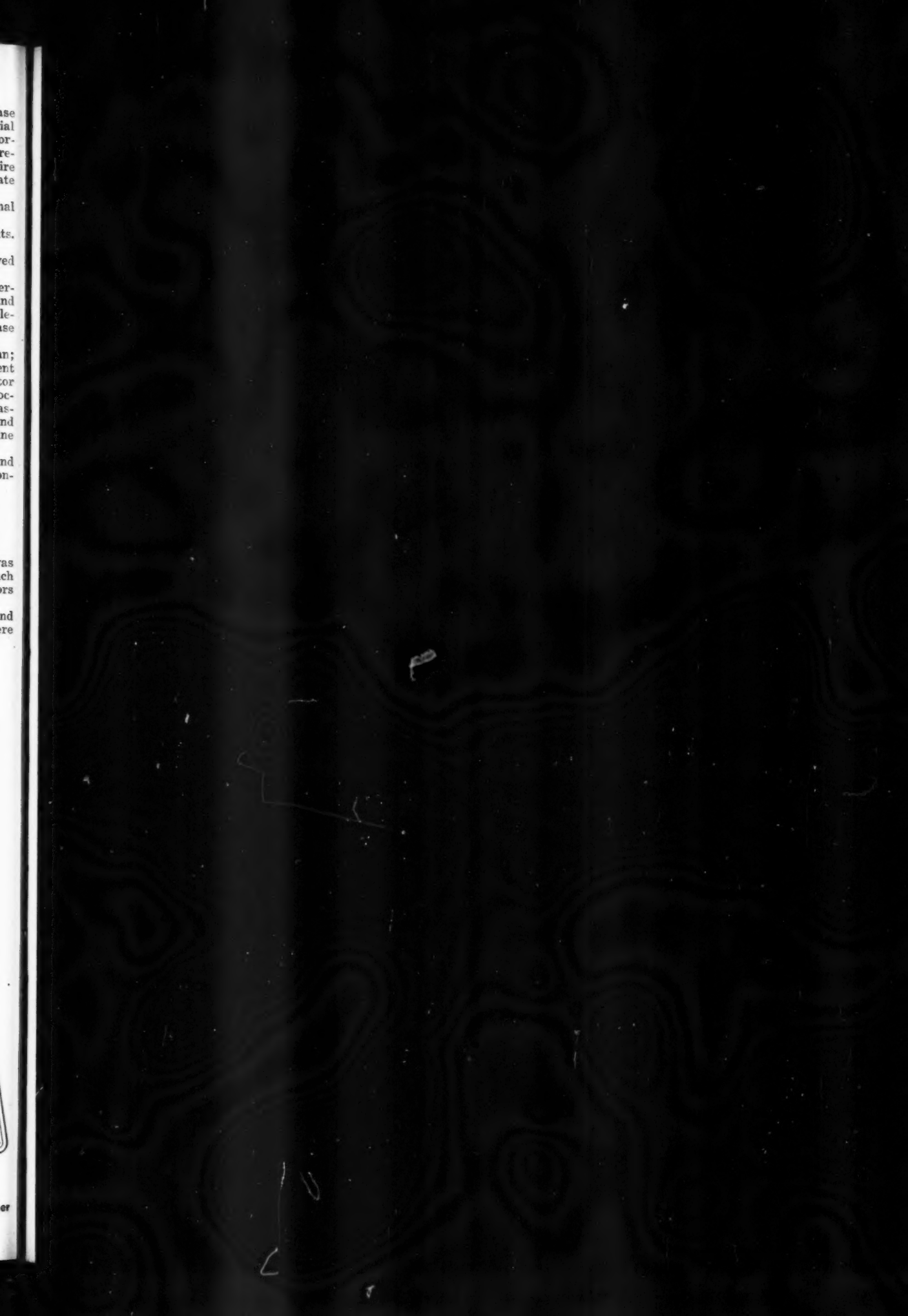


Announcement

Cletrac joins OLIVER

The acquisition of "Cletrac" by **The OLIVER Corporation** proves the importance with which the corporation views the manufacturing and marketing of tractors for industrial and construction needs. To meet the requirements of these users, an Industrial Division of the corporation has been established.

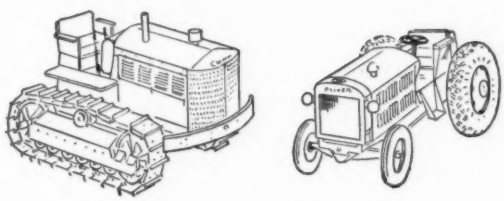
The Industrial Division of **The OLIVER Corporation** will have its headquarters at 19300 Euclid Avenue, Cleveland 17, Ohio. In addition to the well known "Cletrac" line of track-type tractors and allied equipment, the Industrial Division will also have in its charge, sales and service of industrial tractors of the wheel type now in development as well as other industrial products long manufactured by **The OLIVER Corporation.**

"Cletrac" Tractors for agricultural service will be handled by the Agricultural Division of **The OLIVER Corporation,** 400 West Madison Street, Chicago 6, Illinois.

Bringing to "Cletrac's" already ample research, engineering, manufacturing and service the corresponding facilities of **The OLIVER Corporation,** means that a complete line of even better "Cletracs" will be manufactured in the future and that service to "Cletrac" owners will be enhanced.

The dealers who sell **OLIVER** "Cletrac" Tractors are now in a position to serve you more completely than ever. **The OLIVER Corporation,** 400 West Madison Street, Chicago 6, Illinois.

The OLIVER Corporation



named vice presidents, and J. Leo Hoak of Des Moines was re-elected treasurer. New directors elected were S. C. Andersen of Des Moines, Walter H. Lippert of Boone, Ia.; T. L. Sears of Clear Lake, Ia.; George C. Koss of Des Moines, and Weitz.

Campbell Heads N. Dakota Contractors Association

Archie Campbell of Warwick was elected president of the North Dakota Contractors Association at its annual meeting in Jamestown, N. D., in January. He succeeds J. A. Jardine of Fargo. John L. McCormick of Fargo was named vice president and Mrs. Jessie Blewett of Jamestown, secretary. Directors elected were Mary Nierling of Jamestown, Milton Rue of Bismarck, William Collins of Fargo, and Jardine.

Estimate Oklahoma Needs $15,942,000 More for Roads

Ben T. Childers, chairman of the Oklahoma State Highway Commission, estimated that an additional $15,942,000 in Oklahoma highway funds will be needed to finance the first year of postwar highway construction with the available federal-aid apportionments.

It was said that present federal aid available and credited to the Oklahoma State Highway Department amounts to $6,000,000, to which the new federal postwar program will add another $10,142,000. Added to that, it was estimated, will be a requirement of $7,000,000 for annual administration, regular maintenance, and equipment replacement to call for a total of $23,142,000 in state funds the first year.

Estimated income on the present basis of collections is only $7,200,000, which would make it necessary to raise $15,942,000 more to carry out the first year of the program, it was explained.

Additional revenue required for the second year under the estimate will be $9,942,000 and for the third year the figure is cut to $6,142,000 as the department expects increased revenue from existing sources.

A number of steps to bolster the highway fund were being considered by the State Legislature. One provides for transfer of approximately $3,500,000 receipts from 1-cent of the gasoline tax rate which have been going to general uses. Another would transfer to the road fund a $2,000,000 surplus from the general fund July 1. To further supplement the road fund, Governor Kerr recommended use of funds now apportioned to counties to match the feeder road or farm-to-market program provided for in the federal postwar program.

• **Engineers of an infantry division construct a corduroy road through Hurtgen Forest, near Zwaifall, Germany.**
U. S. Signal Corps Photo

Advocate Increase in Gas Tax for Road Building

Utah's motor fuel tax rate would be increased from four to five cents per gallon to finance postwar highway construction under a recommendation made by Gov. Herbert B. Maw in his opening message to the 1945 Utah Legislature. Governor Maw noted that about $4,800,000 per year of federal funds will be available to Utah on a matching basis in the first three postwar years. The state will be unable to match this available revenue, he said, however, unless added state highway funds are raised.

Maine's Postwar Projects to Cost $77,316,816

In a final postwar planning report, Maine's State Development Commission advised the legislature that postwar public works projects proposed by the state and municipalities would cost an estimated $77,316,816 and provide 53,994,023 man-hours of labor.

The commission said $63,294,873 was the estimated cost of suggested state projects, providing 44,993,965 man-hours, against $14,021,943 for proposed municipal developments requiring 9,000,058 man-hours.

The report said the commission had been advised by several state departments that the current legislature

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C-87 Transport Planes Shown in Background
—Press Association Photo

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• An Osgood crane lifts one of the many rolls of British-made Clinton landing mats at a supply depot in England. These mats were used to establish airfields and roads on soft ground during the invasion of Europe.
U. S. Signal Corps Photo

would be requested to appropriate about $17,137,614 for projects, including $5,589,000 the state estimates it currently must raise to take advantage of federal aid postwar highway programs.

Maine's legislature two years ago established a $1,000,000 postwar fund, of which $50,000 was earmarked for planning cost. In last September's special session, the legislators approved fish hatchery and Pownal state school construction calling for an additional $635,000.

"Thus," the commission said, "$1,585,000 has been directly appropriated for a postwar public works program.

"This sum, insofar as it represents potential postwar employment, is further increased by $8,761,400 of other state funds which may be available, $8,006,400 of which represents highway funds. In addition to these items totaling $10,346,000, there is an unappropriated surplus of the general fund, from part of which further sums may be made available by the Legislature for postwar works."

Allman Suggests Joint Session of Engineers

Speaking before traffic and transportation groups in various sections of the country, L. C. Allman, Vice-President, Fruehauf Trailer Company suggests that the automotive engineers who design our motor vehicles and the highway engineers who design our roads should meet on mutual problems.

"A joint engineering conference between the two engineering bodies might well bring forth results of tremendous importance. Certainly a wonderful agenda could be prepared on weight distribution, load and length laws, highway width, speed control, bridge requirements and a number of other vital subjects. A thorough joint discussion of these and other subjects should point the way toward vehicles more suited for our roads, roads which permit full advantage to be taken of advanced automotive engineering and above all—more efficient motor transport to serve America."

New York Has Five-year Road Program of $840,000,000

The $100,000,000 which New York State will receive under the $1,500,000,000 federal highway aid law represents only a small part of what the state plans to spend on highway construction during the five years after the war.

State Public Works Superintendent Charles H. Sells announced that the state contemplated a five-year highway program involving the expenditure of $840,000,000. Part of this would be financed with federal aid, the state matching dollar for dollar and projects subject to approval by the Federal Bureau of Roads.

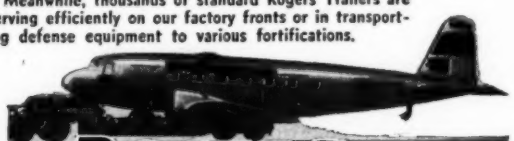
Pointing out that federal money must be spent on particular types of roads, including the federal aid-state highway system, secondary roads and urban roads, Sells said:

"Our next step will be to obtain from the Bureau of Public Roads its interpretation of the law, which is susceptible to various interpretations, on the several classes of roads. With respect to secondary roads, for example, we are

Tanks produce results only in actual combat on the firing line.

To conserve their fighting capacity they ride to battle on Rogers Trailers, or if damaged are transported to the rear for repairs on a retriever type of trailer especially equipped to load disabled tanks.

Meanwhile, thousands of standard Rogers Trailers are serving efficiently on our factory fronts or in transporting defense equipment to various fortifications.



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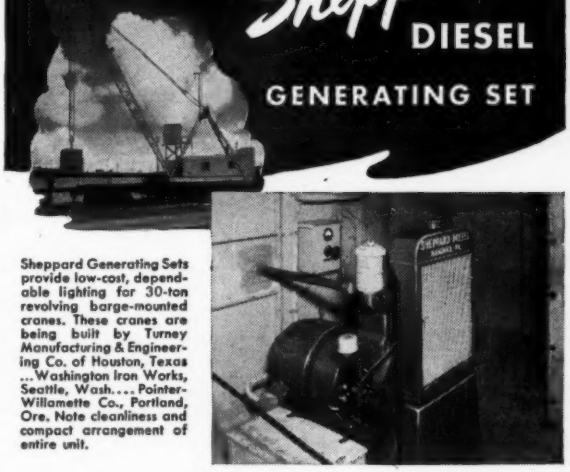

Sheppard Generating Sets provide low-cost, dependable lighting for 30-ton revolving barge-mounted cranes. These cranes are being built by Turney Manufacturing & Engineering Co. of Houston, Texas ...Washington Iron Works, Seattle, Wash.... Pointer-Willamette Co., Portland, Ore. Note cleanliness and compact arrangement of entire unit.

LOWERS NIGHT OPERATING COSTS FOR HUGE 30-TON REVOLVING CRANE

IN hundreds of installations like this one, Sheppard Diesel Generating Sets cut electric bills for users. These generating sets make low cost electricity from cheap fuel. They'll even operate efficiently on the lowest priced domestic furnace oil! And use less of it! . . . for Sheppard Diesels are engineered to squeeze every last watt of power from every last drop of fuel!

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trying to find out how liberal the government is going to be. Those are supposed to be roads which feed the main routes. Aid for urban roads needs interpretation as to the type of street which may be built with such aid."

So much highway construction is needed in New York State, Sells said, that an enormous amount would be necessary in addition to that which would be done under the federal aid program. Extent of the state's program will depend on the State Legislature and its appropriation for carrying out the proposed $840,000,000 program.

Under the new federal aid law, New York State will receive $33,994,000 annually for three years, allocated as follows: Federal aid highway system, $10,840,000; secondary roads, $4,276,000, and urban roads, $18,878,000.

Main beneficiaries under the federal plan are the cities, which heretofore received nothing from the state toward the cost of constructing arterial routes within their limits. Sells said it was the policy of the state to require the cities to participate in the cost of acquiring the rights of way for arterial highways, but this would be a comparatively small part of the total cost of the projects.

• Storm clouds merely portend the storm that will hit the Japs from the air after these bulldozers finish leveling off this air strip on Tarawa which will serve as a "stationary aircraft carrier" to launch raids on Japan. *U. S. Navy Photo*

Sells said the start of the federal-state program might not be delayed until the war ended on all fronts but would depend "on government release of construction materials, priorities and the man-power situation." He added that there would be no delay in getting New York State's program ready for submission to the federal government.

New York's State Department of Public Works has been working for a long time on a comprehensive highway construction program, according to Sells, who said, "we have plans for two years of highway work, exclusive of this program. We will have our program ready for presentation very soon after we get the interpretations from Washington."

Besides having plans in readiness, New York State also has a substantial amount of money available for its postwar highway and other construction projects. A reconstruction fund, created by the 1944 State Legislature, contains $163,000,000, and the state has in sight another surplus of about $100,000,000, much of which is expected to be set aside for postwar purposes.

Suggest $350,000,000 Projects

Highway projects which would cost a total of $350,000,000 have been suggested to the Oregon State Highway Commission, but only a small portion of these can be included in the state's postwar highway construction program with funds expected to be available, it was declared by State Highway Engineer R. H. Baldock.

Under the new federal aid highway legislation, he said, Oregon will receive approximately $12,000,000 a year, with an additional $3,400,000 of forest funds, in the first three postwar years.

He said that passage of the federal highway bill would make it possible for the Oregon Highway Commission to speed up the formulation of its postwar program, which has been in progress for several months.

Seabees Observe Anniversary of Founding on Dec. 28, 1941

Just three years ago last December 28, in the dark days following the disaster at Pearl Harbor, an order was rushed from the U. S. high command to the Bureau of Yards and Docks instructing the bureau to recruit with all possible speed 3,000 skilled construction workers who could build crucial advance air and naval bases in the Pacific, and to train them to defend what they would build. That order was the birth certificate of the youngest and the "workingest and fightingest" branch of the nation's armed forces, the U. S. Naval Construction Battalions—better known as the Seabees.

Today the Seabees' complement is

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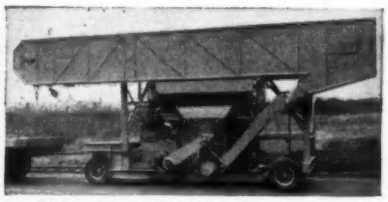

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• **Bucyrus-Erie 15-B crane swings a load of ammunition for a GI truck onto the ground at an ammunition dump in France. It will be sorted and sent to different parts of the dump along the conveyor belts (lower right) by the waiting soldiers. From this dump the ammunition is forwarded to various units at the fighting fronts.**
U. S. Signal Corps Photo

250,000 officers and men, 76 per cent of whom at present are overseas. The personnel of the Seabees is drawn largely from the hard-handed builders who as civilians built the nation's bridges, roads and dams, who strung its cables, laid its pipelines, erected its skyscrapers. The Seabee officers, members of the Navy's Civil Engineering Corps, were, prior to their present service, engineers, construction superintendents and contractors. Head man of the Seabees is non-Annapolis Vice-Admiral Ben Morell, U.S.N., the CEC officer who heads the Bureau of Yards and Docks.

"The Seabees have come forward as an institution more quickly than ever I knew one in the whole of our history," President F. D. Roosevelt said speaking to a group of Seabees overseas on the Seabees' third anniversary.

Grant Price Increase for Cement In Nine States

Manufacturers of cement in the states of Wisconsin, Illinois, Indiana, western Kentucky, North and South Dakota, Minnesota, Iowa and eastern Missouri, have been granted an increase not to exceed 20 cents per barrel in their present maximum prices, the Office of Price Administration announced.

The increase, which becomes effective January 8, 1945, applies to all types of Portland cement, except white cement, and includes masonry cement and other special types. The increased price may be charged where the sale is made f.o.b. a mill within the area, or on a delivered basis to a destination point within the area covered by the action.

Persons and firms reselling this cement without further processing may add to their present maximum prices the actual increased cost resulting to them from adjusted producers' ceilings.

Butler Brothers Ore Shipments in 1944

A total of 2,742,015 tons of ore was shipped by Butler Brothers during the 1944 ore season which opened April 10 and closed November 20. This was a gain of 838,015 tons for the year.

Of the total amount shipped 142,547 tons were merchantable ore, 190,567 tons were dried at Butler's Weggum drying plants and 2,408,901 tons were concentrates. In addition 111,009 tons of concentrates were produced for outside companies. These companies furnished the crude ore and Butler Brothers washed it for them.

Of the total shipments the Cooley district shipped 1,922,668 tons; the Hibbing district, 681,350 tons; the Virginia district, 4,127 tons and the Cuyuna district, 117,870 tons.

1944 Mineral Production In United States, Alaska

The United States and Alaska produced a record total of $8,543,000,000 in minerals in 1944 to shatter the previous high of $8,056,000,000 established in 1943.

Quoting information provided by the Economics and Statistics Branch of the Bureau of Mines, Secretary of Interior Harold Ickes said the 1944 output represents a gain of 6 per cent over 1943, the first year that output passed the $8,000,000,000 mark. In 1942, another record year, output was $7,575,700,000.

The 1944 peak was 54 per cent higher than the World War I total of $5,540,708,000, established in 1918, and represents the all-out efforts of the mineral industry to meet the exceedingly heavy demands of the armed forces for war equipment and materials.

Of the estimated total of $8,543,000,000 in mineral output in 1944, mineral fuel contributed $5,254,000,000, compared with $4,589,000,000 in 1943, an increase of more than 14 per cent; metallic products reached $2,377,000,000, compared with $2,493,000,000 in 1943, a drop of nearly 5 per cent; and other non-metallic minerals, $912,000,000, compared with $974,000,000 in 1943, a decline of about 6 per cent. Major factors contributing to the decline in metallic products and non-metallics, other than fuels, were the reduced demand for certain metals, manpower shortages in many mineral-producing areas, and the continued slump in the building industry.

Declines rather than gains were commonly recorded in the metals group,

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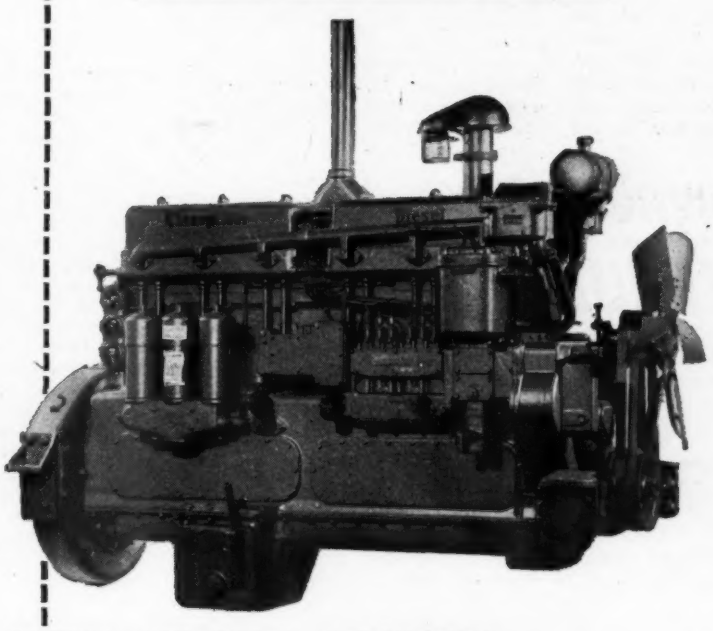

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significant ones including aluminum, bauxite, chromite, copper, ferro-alloys, gold, iron ore, lead, mercury, molybdenum, silver, tantalite-columbite, tungsten, vanadium and zinc. Gains were registered for beryllium, cadmium, manganese ore, pig iron, nickel, and platinum.

All the fuels—anthracite, bituminous coal, coke, natural gas, natural gasoline and liquefied petroleum gases, and petroleum—registered gains.

Of the other nonmetallic minerals, asbestos, native asphalt, barite, boron minerals, emery, feldspar, fluorspar, lithium minerals, mica, mineral pigments, phosphate, potash, pyrites, salt, sodium salts, sulfur, and talc showed moderate to large increases. Decreases were shown by most abrasives, cement, clay products, graphite, kyanite, peat, sand and gravel, slate, and stone.

The year-end report on domestic mineral production, submitted by the Bureau of Mines to Secretary Ickes, follows:

METALLIC PRODUCTS

Light metals.—Drastic curtailment of light metal production was necessitated in 1944 because of the changing pattern of munitions production and excessive original estimates of needs. Output of primary and secondary aluminum, plus Canadian imports, far outstripped requirements in 1944 so that over-all cutbacks aggregating about 54 per cent of total capacity were made during the year. As a result, output of primary aluminum fell from 920,179 short tons in 1943 to 777,700 tons, valued at $238,300,000, in 1944. Production and consumption of bauxite declined markedly in 1944, and late in the year production reached the lowest monthly rate in nearly two years. Shipments dropped from 7,496,250 short tons in 1943, to 3,344,800 tons, valued at $16,680,000, a decline of about 55 per cent. In line with reduced output of aluminum and bauxite, the production of alumina (from which the metal is made) also was greatly curtailed during the year, and over-all cutbacks totaled about 58 per cent of original installed capacity.

Decreased demand for magnesium and a growing stockpile of the metal forced production downward precipitously in the second half of 1944. By the end of the year output was reduced to about 15 per cent of the original rated capacity. An extremely large part of the cut-back occurred in Government-owned plants, all but four of which ceased production. Output for the year was 170,000 short tons, valued at $69,700,000—virtually the same as for 1943.

Iron and steel.— Production of pig iron and steel advanced 1 per cent in 1944, but a decrease in demand for alloy steel resulted in a decline of 7 per cent in the quantity and 5 per cent in the value of all ferro-alloy shipments. Shipments of iron ore declined 3 per cent from 1943 to a total of 96,100,000 gross tons. Most of the decrease was in the Lake Superior District, where shipping quotas were lowered intentionally because of large stocks at blast furnaces.

Ferro-alloying minerals. — Molybdenum shipments from domestic ores were about 70 per cent of the 1943 total, due to lower production of alloy steels and a lessened demand for molybdenum as a substitute metal. Vanadium output dropped about 40 per cent, following the cancellation of contracts for Government purchases. Chromite shipments slumped to less than 30 per cent of the 1943 total while chromite imports from foreign sources were down from 1943 because of lack of shipping, and production of tungsten concentrates was down almost 8 per cent. On the other hand, the production and consumption of titanium reached new highs, and the output of manganese ore containing 35 per cent or more manganese was the largest since 1918, and 1944 was the second most productive year on record.

Gold and silver.—War conditions continued to depress the gold and silver industries in 1944. The issuing of Government grants for the limited production of gold under Order L-208 had little effect in increasing the output, and decreased base-metal production lowered the yield of gold and silver from this source. Production of gold in the United States (Alaska included) was estimated at 988,600 ounces, valued at $34,601,000, compared with 1,380,758 ounces in 1943, a decline of over 28 per cent in both quantity and value. Silver output in 1944 totaled 34,873,000 ounces, valued at $24,798,700, compared with

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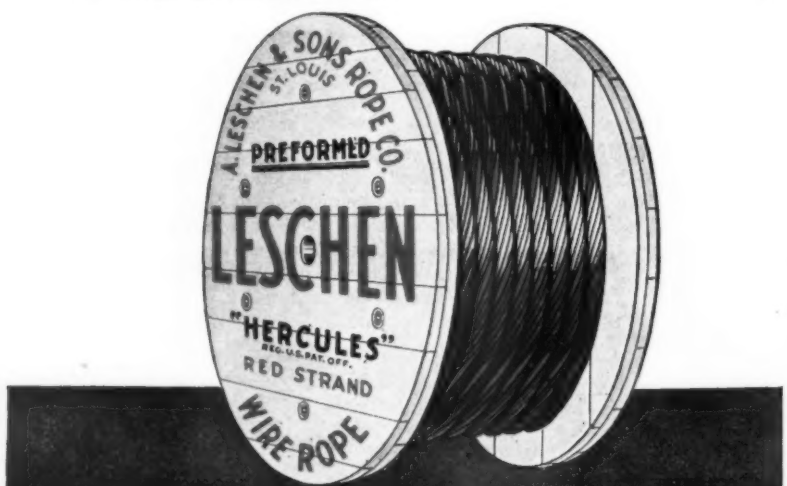

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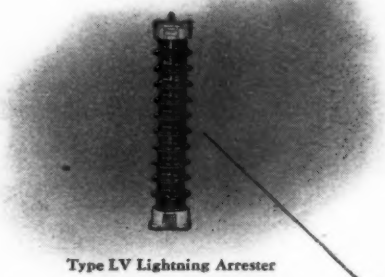
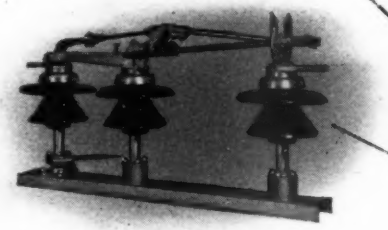
Power Distribution

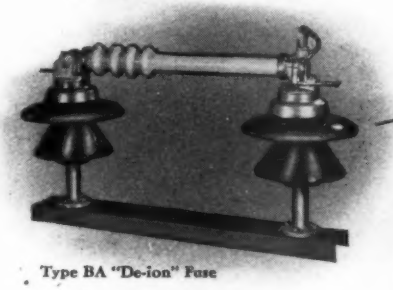
IN OPEN-PIT MINES AND QUARRIES



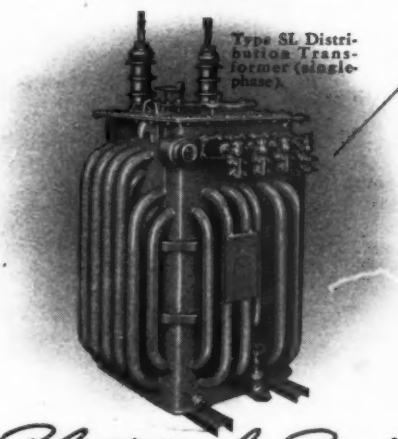
Type LV Lightning Arrester



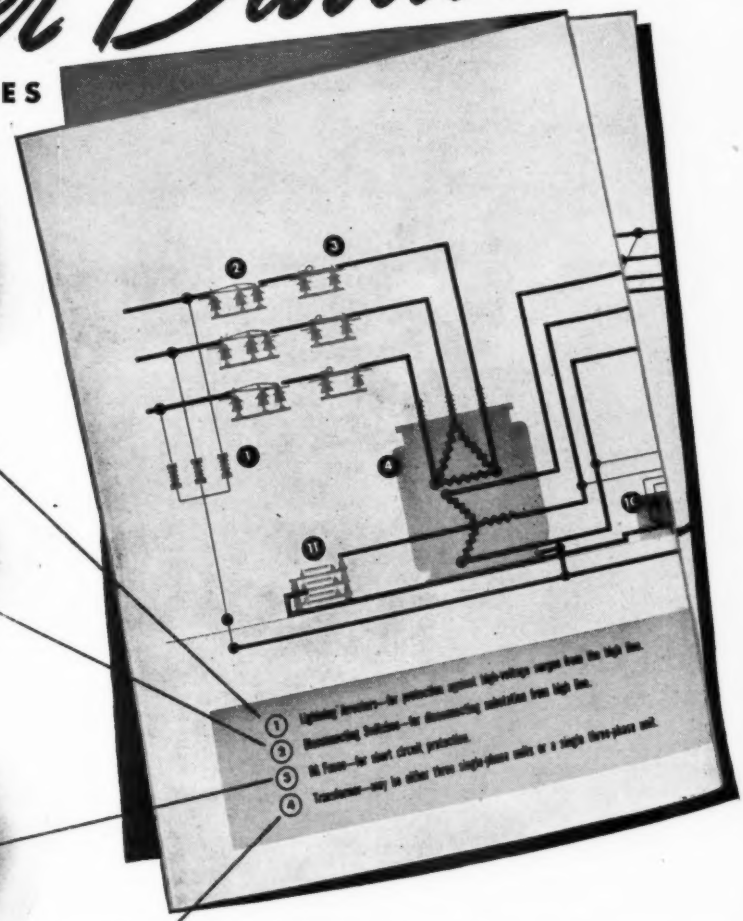
Type KA Disconnecting Switch



Type BA "De-ion" Fuse



Type SL Distribution Transformer (single-phase)



A properly engineered electric power distribution system costs little more than one which is hazardous and unreliable. The reward is increased production—and the safeguarding of your employees' lives.

You owe it to yourself to check your present system for the all-too-common sources of trouble. Probably you will find that a small investment in one or two simple protective devices is all that is needed.

Westinghouse manufactures every type of equipment needed for a complete modern open-pit distribution system. How this equipment can be adapted to your present system to provide adequate protection is shown in a new book, B-3282, just issued. Typical of the many explanatory illustrations it contains, is the sample page shown above. To get your free copy write Westinghouse Electric & Manufacturing Company, Dept. 7-N, East Pittsburgh, Pennsylvania. J-94609

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

Electrical Equipment for the Mining Industry

40,794,568 ounces in 1943, a decline of nearly 15 per cent in both quantity and value.

Copper, lead and zinc.—Production of copper declined 9 per cent in 1944 and lead 4 per cent, despite the continued need for large supplies of copper and the "tight" situation of lead with respect to supply. The position of zinc was easier in 1944, and stocks gained throughout the year to reach a record high, even though output of the metal dropped 4 per cent from that in 1943. A shortage of labor was the main factor in the slump of all three metals. Smelter production of copper from domestic ores declined to about 990,000 tons valued at $234,000,000 (exclusive of premium payments to mines), compared with 1,092,939 tons valued at $257,934,000 in 1943. The output of refined lead from domestic ores in 1944 was estimated at 385,000 tons, valued at $49,280,000, and slab zinc at 568,000 tons, valued at $97,696,000. These values also are exclusive of premium payments.

• Bucyrus-Erie bulldozer-equipped TD-18 diesel TracTracTor dozes coral used as a topping over a muddy area on one of our Pacific island bases. *U. S. Navy Photo*

Other metals.—Mercury production in 1944 dropped about 27 per cent in quantity and 56 per cent in value, following a sharp decrease in demand late in 1943 and the withdrawal of Government purchasing. Antimony output at the mines was somewhat below the high point reached in 1943, since large reserve stocks and imports made increased production unnecessary. Output of arsenic, beryllium, and cadmium was up, but that of tantalite and columbite declined.

MINERAL FUELS

Bituminous coal.—The production of bituminous coal and lignite reached an all-time high in 1944 with an estimated output of 620,000,000 net tons, compared with the previous peak of 590,177,069 tons in 1943. This record performance was accomplished despite interruptions to output caused by labor shortages and difficulty in obtaining supplies and machinery.

Although production was the greatest on record it still was not sufficient to meet the demand created by the war program. By keeping a careful check on critical requirements and the diversion of and allocation of coal to important industries, the Solid Fuels Administration for War has endeavored to keep distress to a minimum.

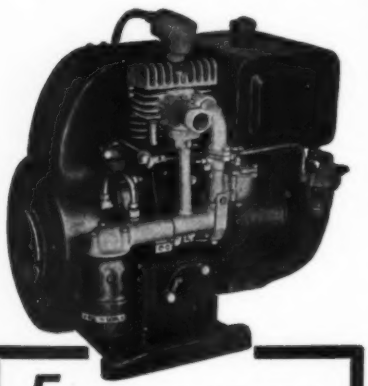
Pennsylvania anthracite. — Although production of Pennsylvania anthracite in 1944 increased to approximately 64,300,000 net tons, a gain of 6 per cent over 1943, the demand exceeded the output, and strict allocation was used to effect an equitable distribution of the available supplies. Shortages of other space-heating fuels, expanded purchasing power of domestic consumers, and the high rate of industrial activity were largely responsible for the continued heavy demand for anthracite. The scarcity of manpower was the principal factor in limiting production in 1944.

The 1944 production, the highest since 1930, had an estimated value at the mine of $359,000,000.

OTHER NON-METALLIC MINERALS

The production value of non-metallic minerals other than fuels in 1944 was approximately $912,000,000, which was 6 per cent lower than the $974,000,000 recorded in 1943. The decline, however, was not consistent throughout the industries. The output of products that have special military or essential civilian uses in general equalled or exceeded that of 1943, but building materials, which constitute the largest items, declined substantially. This was to be expected because war facilities were virtually completed whereas war housing and civilian construction remained at a low level.

Building materials. — Cement shipments declined from about 130,000,000 barrels in 1943 to 96,000,000 in 1944. The value of total sales declined 24 per cent. Crushed stone and gravel and sand, which are used chiefly as aggregates in concrete construction and for highways and railroad ballast, declined more than 20 per cent in value of output. The quantity produced dropped from 405,000,000 tons in 1943 to approximately 320,000,000 in 1944. Sales of heavy clay products declined several per cent, and production of building stone and slate reached the lowest point in their recorded history. The sustained demand for gypsum board in certain types of military construction enabled the gypsum industry to maintain activity almost as high as in 1943. Demands for building lime were weak, but because of the heavy requirements of agricultural, chemical, and refractory users the total output was probably a little higher than in 1943 and therefore established an all-time high. The wide movement to conserve fuel by use of home insulation led to a small increase in total sales of mineral wool and ver-



ELECTRICITY

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ONAN ELECTRIC GENERATING PLANTS supply reliable, economical electric service for excavating and contracting uses as well as for scores of other general applications.

Driven by Onan-built, 4-cycle gasoline engines, these power units are of single-unit, compact design and sturdy construction. Suitable for mobile, stationary or emergency service.

Models range from 350 to 35,000 watts. A. C. types from 115 to 660 volts; 50, 60, 180 cycles, single or three-phase; 400, 500, and 800 cycle, single phase; also special frequencies. D. C. types range from 6 to 4000 volts. Dual voltage types available. Write for engineering assistance or detailed literature.

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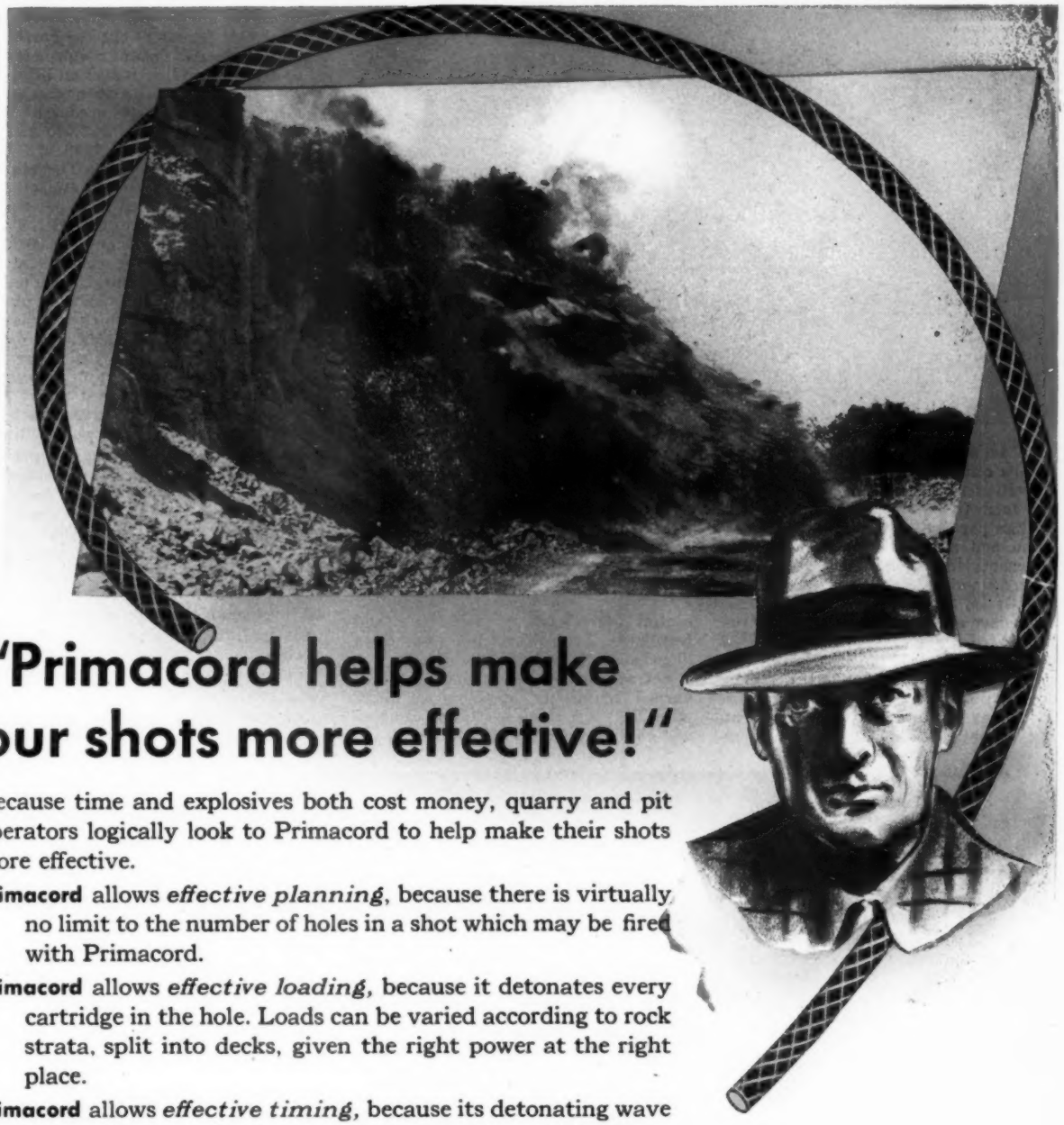
ELECTRIC PLANTS Onan



"Primacord helps make our shots more effective!"

Because time and explosives both cost money, quarry and pit operators logically look to Primacord to help make their shots more effective.

Primacord allows *effective planning*, because there is virtually no limit to the number of holes in a shot which may be fired with Primacord.

Primacord allows *effective loading*, because it detonates every cartridge in the hole. Loads can be varied according to rock strata, split into decks, given the right power at the right place.

Primacord allows *effective timing*, because its detonating wave is practically instantaneous, but moves in a definite sequence. Front rows shoot first, relieving the pressure a split second ahead of the back row shots.

Primacord allows *effective firing*, because it imparts a powerful detonation to each cartridge, results in full efficiency of the explosives.

Primacord allows *effective working*, because it gives better fragmentation for easier handling.

P-2

Five fingers up for five reasons to choose Primacord Detonating Fuse.

THE ENSIGN-BICKFORD COMPANY • Simsbury, Connecticut

Also
ENSIGN-BICKFORD SAFETY FUSE
Since 1836

PRIMACORD-BICKFORD Detonating • Fuse •

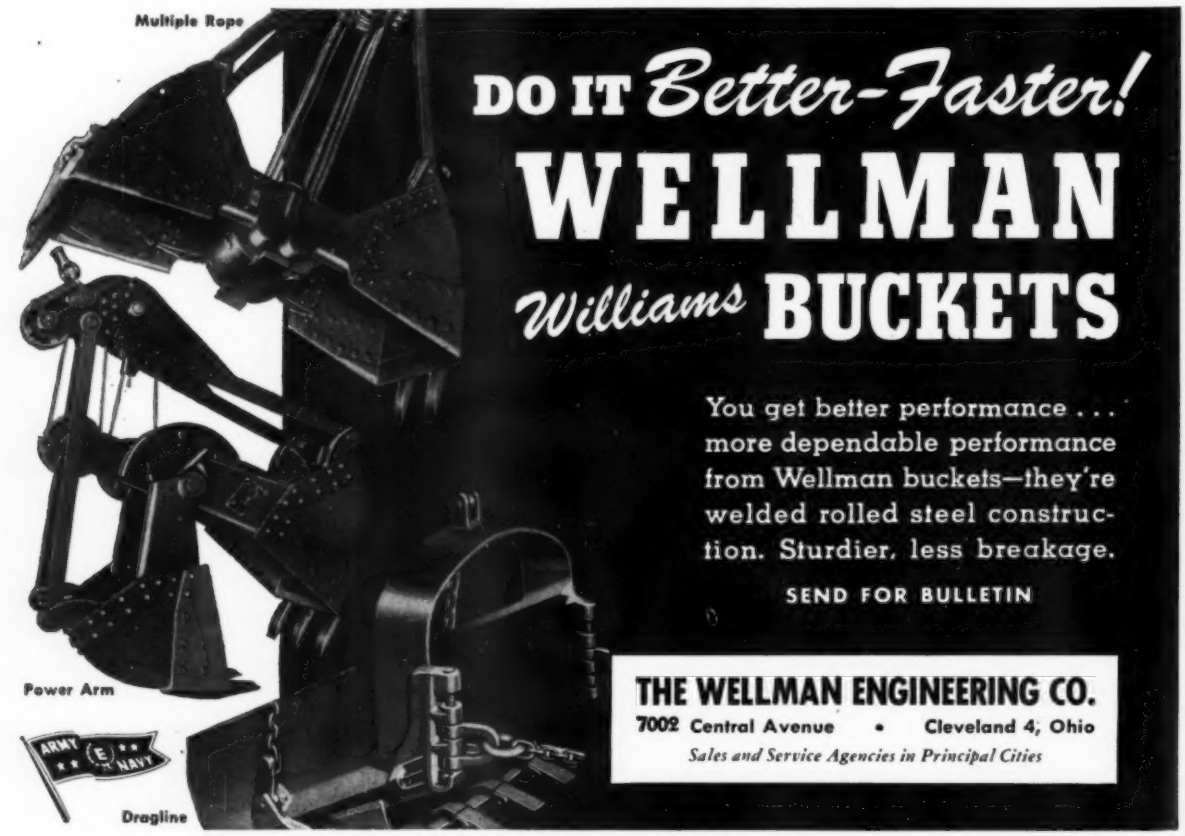
• Burning native huts along a beach in Dutch New Guinea to make room for unloading cargo from landing craft. The Bucyrus-Erie ½-cu. yd. shovel in right foreground will be used to level the area and dispose of the debris.
U. S. Signal Corps Photo

miculite, even though the requirements of new construction were very small.

Fertilizers. — The enormous demand for food to satisfy the needs of our civilian population, our armed forces at home and abroad, our allies, and the undernourished populations of liberated countries has placed so heavy a burden on agriculture that fertilizer sales have exceeded all previous records. Estimated sales of phosphate rock exceeding 5,500,000 long tons and of potash reaching 820,000 short tons (K_2O content) have set new marks for these industries. Nitrate plants were operating virtually at capacity to furnish essential ingredients of explosives and fertilizers. Agricultural limestone sales likewise were exceedingly high.

Refractories.—The demand for dead-burned magnesite, dead-burned dolomite, fire clay, silica brick, and alumina and chrome refractories was strong because of the high level of activity of metallurgical furnaces, but the curtailment of magnesium metal requirements led to a corresponding reduction in output of crude magnesite and magnesium chloride. Crude magnesite production in 1944 was approximately 523,000 tons, compared with 754,832 in 1943.

Chemical Raw Materials.—The manufacture of synthetic rubber and other chemical uses stimulated an 8 per cent increase in sales value of salt. The quantity sold—more than 16,000,000 tons—was nearly 6 per cent greater than in 1943. The chemical, and particularly the fertilizer industries, created an active demand which increased the sales of sulphur to 3,500,000 tons, 18 per cent higher than in 1943. Pyrites production increased about 6 per cent. Crude barite sales increased about 25 per cent, reaching 525,000 tons to satisfy the heavy demands for well-drilling muds, lithopone, and barium chemicals. Requirements for the glass, cleanser, and fertilizer trade as well as for export stimulated an increase in production of boron minerals to 330,000 tons, which was almost the level of 1937, the high record year. Bromine production reached an all-time high of about 103,000,000 pounds because of the demand for larger and larger quantities of anti-knock gasoline. The production of lithium minerals, which have important war uses, increased to about 14,600 tons, which was nearly 80 per cent greater than in 1943. The production of stronti-



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Williams BUCKETS

You get better performance . . . more dependable performance from Wellman buckets—they're welded rolled steel construction. Sturdier, less breakage.

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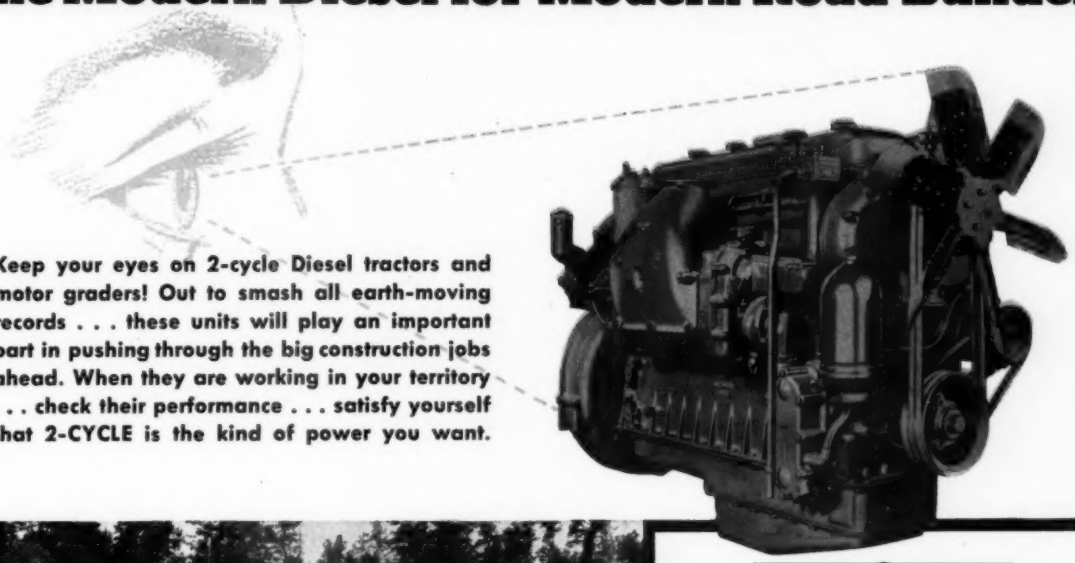
WATCH 2-CYCLE!

The Modern Diesel for Modern Road Builders



Keep your eyes on 2-cycle Diesel tractors and motor graders! Out to smash all earth-moving records . . . these units will play an important part in pushing through the big construction jobs ahead. When they are working in your territory . . . check their performance . . . satisfy yourself that 2-CYCLE is the kind of power you want.

WHAT 2-CYCLE DIESEL POWER MEANS:

TO A TRACTOR

It means *plenty of drive!* Every down stroke of the piston is a power stroke. It means *smooth power* — maintains high torque over a wide speed range. It means *faster power*—there is quick pick-up . . . less gear-shifting . . . high-speed hauling. It means *thrifty power.* Unit injectors simplify fuel system, reduce maintenance cost—fuel is thoroughly atomized, burns completely and develops maximum power.

TO A MOTOR GRADER

It means power to move *more material.* Extra dirt-moving capacity is built into the A-D Motor Grader. You can handle the heaviest kind of work —from deep, tough scarifying to high, heavy bank cuts. You get *a smoother job, too* — has the reserve power to carry you through tough cuts with fewer blade adjustments. Gets the job done *faster*—works in a higher gear!

KEEP AN EYE ON THE FUTURE

BUY AND KEEP WAR BONDS

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

• Baker Gradebuilder on Allis-Chalmers tractor constructing a road in the South Pacific.

um minerals, on the other hand, dropped to only about 1,500 tons, which was one-fifth of the 1943 output. The decline is attributed to depletion of the higher-grade deposits and increasing competition of barite in well-drilling muds.

Other Non-metals.—Continuing high demands for strategic mica and an increase in the Government price from $6 to $8 a pound resulted in a moderate advance in sales of the domestic product. Sales of scrap mica for grinding also increased. An advance was noted in production of natural and synthetic iron oxide pigments needed in large quantities for painting military establishments and equipment. The import situation with respect to graphite eased considerably during the year in consequence of which Government contracts to produce and stock domestic graphite were cancelled and production declined to about 4,000 tons compared with 9,597 in 1943. An increase of approximately 5 per cent in sales of feldspar to a total of about 325,000 long tons was due in part to expansion of glass manufacture to furnish containers and building materials that could be substituted for metals needed more urgently in making war munitions. Talc output (including pyrophyllite), which reached 415,000 tons, was a little higher than in 1943 owing primarily to increasing quantities employed as synthetic rubber filler.

It's easier to lift, lower, push or pull the Simplex Way!
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LEVER · SCREW · HYDRAULIC
Jacks
for every construction purpose
Awarded the Gold Medal for Safety
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Templeton, Kenly & Co., Chicago 44, Ill.

Appoint Forester Engineer of San Luis Valley Project

Appointment of Don M. Forester as project engineer for the Bureau of Reclamation's eighteen million dollar post-war project in Colorado's San Luis Valley has been announced by Wesley R. Nelson, regional director of the agency, with offices at Amarillo, Texas.

President Approves Big Flood Control Bill

President Roosevelt signed the $959,000,000 flood control authorization bill on December 23.

The approved bill authorizes $200,000,000 for bank stabilization on the lower Mississippi River. It will mean in the post-war years that Army Engineers will undertake to nail down the river to afford even greater protection to the main line levees. Brig. Gen. Max C. Tyler, President of the Mississippi River Commission, plans to spend $15,000,000 annually for 15 years to stabilize the unstable banks along the entire length of the alluvial valley. He has been experimenting for some months with new types of revetment that can be awarded to contractors.

Lubrication Engineers Organize, Hold Convention

Lubrication engineers representing prominent industrial and transportation companies and educators have organized a non-profit body known as the American Society of Lubrication Engineers, with headquarters at 135 South LaSalle Street, Chicago.

Perry Ford Succeeds Sours As Ohio Highway Director

Perry T. Ford, veteran Ohio civil engineer and past president of both the Ohio and National Societies of Professional Engineers, has been appointed Ohio state highway director by Gov. Frank J. Lausche to succeed Hal G. Sours, effective January 22.

Capitol Equipment for Gold Mining Industry Delayed

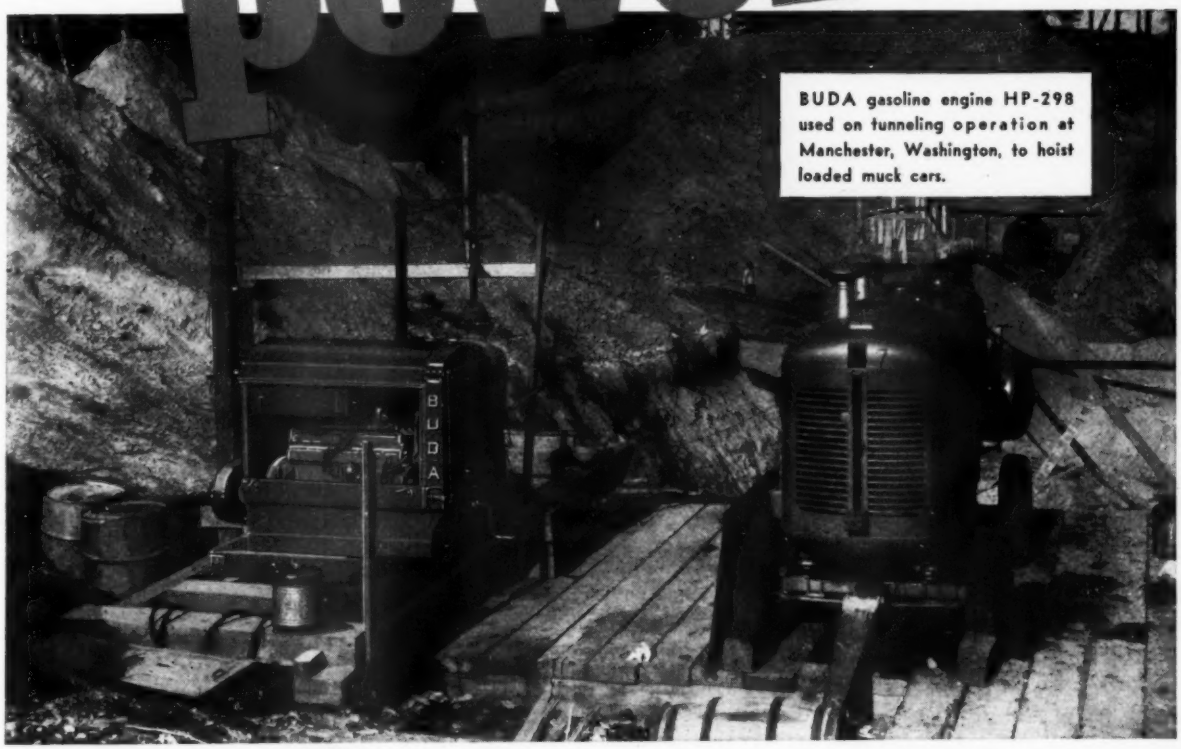
The gold mining industry faces the likelihood of postponed action on all applications for capital equipment until late in 1946 unless the manpower and materials situation improves materially before then, the War Production Board said.

Spokesmen for WPB's Office of Vice Chairman for Metals and Minerals pointed out that there are many items of equipment such as locomotives, hoists, motors and certain types of ore preparation equipment that cannot be approved for early manufacture to be used in the gold mining industry, as they are urgently needed for critical war programs.

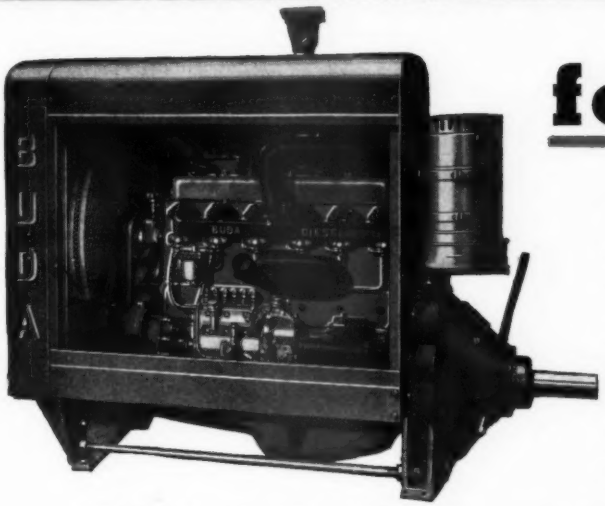
WPB officials emphasized, however, that the agency desired to assist in the rehabilitation of gold mines that have been closed in conformity with Order L-208, wherever such rehabilitation is possible without impeding the war program. Likewise every consideration will be given applications for capital equipment filed by mines presently operating by special authorization under L-208, they added. Every application must be considered on its own merits and in relation to the production of critical machinery required for essential mining programs.

Such applications as may be made for this equipment should be addressed to the Mining Division, War Production Board, Washington 25, D. C., where all deliveries and schedules will be controlled for both foreign and domestic requirements, except Canada. Canadian applications should be forwarded through the Department of Munitions and Supply, Ottawa, Canada.

power...



BUDA gasoline engine HP-298 used on tunneling operation at Manchester, Washington, to hoist loaded muck cars.



for hoisting

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Diesel . . . Gasoline
Natural Gas . . . Butane
20 to 340 H.P.

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• Bucyrus-Erie Bullgraders did a large share of the work when the Seabees built the U. S. Naval Air Station at Adak. *U. S. Navy Photo*

OBITUARIES

George S. Whyte

George S. Whyte, 77, chairman of the board of the Macwhyte Company, Kenosha, Wisconsin, wire rope manufacturers, died suddenly of a heart attack at his home on December 15.

Mr. Whyte was born in Crossgates, Scotland, in 1867, and arrived in America in 1884. A few years later he joined the sales force of Washburn and Moen Company, makers of wire rope. In 1896 he became a member of the Leschen Macomber Whyte Rope Company which erected a factory in Coal City, Ill., in 1901. The company moved to Kenosha in 1912 and the first piece of rope made in the new Macomber Whyte Rope Company plant in Kenosha was produced September 8 of that year.

George S. Whyte's son, Jessel S. Whyte, became foreman of the mill in 1914, rose to the position of president and general manager and took over many of his father's responsibilities when the elder Whyte became chairman of the board.

Charles D. Vail

Charles D. Vail, 76, for 14 years Colorado state highway engineer and widely recognized as one of the nation's outstanding road engineers, died January 8 in a Denver hospital after a long illness.

When Vail took office as road engineer in Colorado the state had only slightly more than 500 miles of hard-surfaced highways and he launched an ambitious program of completing a network of modern roads. Colorado now has more than 4,400 miles of hard-surfaced roads, although completion of the network had to be deferred because of the war.

It was under his administration that Colorado completed much of its modern highway system, including major construction projects through rugged canyons and over high mountain passes.

Gov. John C. Vivian announced that Oliver T. Reedy, senior assistant to Vail, would be acting highway engineer and indicated he might later make a provisional appointment so that civil service examination to fill the post permanently would be delayed until after the war.

Born on a farm near Lone Tree, Ill., Vail was graduated from Illinois University in 1891. While still in college he was given his first engineering assignment with a railroad under construction in South Dakota. After his graduation he went to Cheyenne, Wyo., as instrument man with the Union Pacific Railroad and subsequently was construction engineer on railroads in Texas, Mexico, Utah and Oregon. From 1896 to 1905 he was waterworks engineer in Butte, Mont., and during that period supervised construction of waterworks systems in Montana, Idaho and Canada. He continued on various assignments as railway and hydraulic engineer throughout the West until 1917, when he was named engineer for the Colorado Public Utilities Commission. In September, 1923, he was named manager of improvements and parks for Denver, and in December, 1930, he was appointed Colorado state highway engineer.

Mr. Vail was a member of the American Society of Civil Engineers, the Colorado Society of Civil Engineers and the American Road Builders Association. He also was a past president of the Western Association of State Highway Officials.

Surviving are a daughter, Mrs. Vera Winslow of Denver, with whom he made his home; two sons, Kenyon C. Vail, materials engineer for the Colorado State Highway Department, and Allen Vail, with the Colorado Public Service Commission in Alamosa, and a brother, Richard R. Vail, superintendent of the Denver mountain parks. His wife, Mrs. Jessie P. Vail, died in November, 1937.

MEMO TO ALL CONSTRUCTION SUPTS:
What's this about HAISS buckets giving 40% more efficiency?
Get the facts
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For Catalogs, Prices, Deliveries
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GEORGE HAISS MANUFACTURING CO., INC., 144th St. & Park Ave., New York 51, N. Y.

Equipment you ought to KNOW ABOUT

For further details about the equipment on these pages please write to the manufacturer, mentioning Excavating Engineer.

Donaldson Field Test Unit

Manufacturer: The Donaldson Co., Inc., St. Paul, Minn.

Claims: This Donaldson mobile air cleaner field test unit can go anywhere on its two-wheeled chassis behind any passenger car. For purposes of duplicating working conditions in the field it can be drawn behind the tractor or other machine. Or, it can be parked adjacent to stationary units in operation. Completely self-contained it is equipped with two internal combustion engines which power individual blowers to provide the desired air flow for testing purposes. As many as four cleaners can be tested simultaneously.

The unit was developed to substantiate laboratory findings and to make field testing easier and more accurate.

Tests made with the Donaldson Field Test Unit can be accepted as conclusive because conditions under which tests are made are precisely those under which the installed cleaner would operate.

Truck Tire

Manufacturer: The B. F. Goodrich Company, Akron, Ohio.

Claims: New design and construction of the Speedliner Silvertown truck tire makes it run cooler than ever before. It is available in size 7.50-20 eight ply or larger.

Reduced tread thickness at the shoulders and addition of new ventilating grooves in the shoulder blocks are principal changes in construction to lessen operating heat. Other improvements in design reduce dangers of sidewall cracking.

All-Purpose Conveyor

Manufacturer: Coaltaker Conveyor Company, 310 South Michigan Ave., Chicago 4, Illinois.

Claims: The Tote-All conveyor is a light weight, portable endless belt-type conveyor efficient for handling many conveying jobs. Available in two lengths, 13'9" and 20'. Either model may be driven by an electric motor or gasoline engine. Conveyor comes equipped with 1½ H.P. gasoline engine, which is ideal for most conveying, or a 2.3 H.P. engine for heavy-duty work—or conveyor may be had without power unit, where user has his own motor.

All models may be had with a standard engine mounting or a high engine mounting for conveying bulky material. Engine-mounting on models equipped with gasoline engine is adjustable to keep engine level regardless of angle of conveyor.

Normal belt speed is 420 F.P.M. Variable speed drive pulley is available if desired.

Cromate Gaskets

Manufacturer: The Sherwin-Williams Company, Cleveland, Ohio.

Claims: A new-type gasket consisting of a felt base impregnated with a chromate pigmented compound which renders the material flame and fire-resistant as well as corrosion resistant. Originally intended as a substitute for low-pressure rubber gaskets required

in marine ventilating systems, chromate gasketing has since demonstrated its usefulness in many other applications, including joint seals in water, fuel oil and diesel oil systems.

Chromate gasketing can withstand relatively prolonged exposure to salt water without decomposition. It may be had either factory pre-cut or cut from sheet at the point of use without special tools.

A chromate gasket will maintain air pressures up to 25 pounds per square inch at normal temperatures. It is not affected by fuels and has definite rust inhibiting properties. Chromate gasketing is dark green in color and is available in two thicknesses, ⅛-inch and 1/16-inch.

Half-yard Shovel

Manufacturer: Koehring Company, Milwaukee 10, Wis.

Claims: This new half-yard shovel is convertible to crane, dragline or pull shovel. It is also available as a Cruiser Crane mounted on rubber tires, and can be furnished for truck mounting.

Orders are now being accepted on a priority basis for shipment when present military needs are terminated. Outstanding design improvements are: same boom for shovel or pull shovel operation; trigger-fast dipper trip; independent unit traction gear case; easily removable machinery units; instant travel reverse; spacious walk-around area; head room in all parts of cab.

Heavy Duty Hydraulic Trailer Brakes

Manufacturer: C. R. Jahn Company, 1341 W. 37th Pl., Chicago, Ill.

Claims: Jahn heavy duty trailers with capacities ranging from five to 100 tons are now available with hydraulic brakes. These are the same type of brakes that have proved so efficient and safe on millions of trucks and passenger cars.

This new application of hydraulic brakes which was developed and thoroughly tested by Jahn engineers, means smoother, faster braking action with positive, equal brake pressure on all wheels. There's no possibility of partial application or dragging of the brakes when operating over rough terrain. Full motive power can be utilized in pulling the load. Unlimited oscillation of the tandem axles is possible without affecting braking action.

With brake rods, pins and cables eliminated, maintenance is reduced to a minimum and safety is greatly increased.

Aluminum Mallets and Hammer Faces

Manufacturer: Greene, Tweed & Co., Bronx Blvd. at 238th St., New York 66, New York.

Claims: These new aluminum mallets and hammer faces have been developed to replace all other types of soft faced striking tools and to provide a single mallet or hammer for every kind of work where a soft faced striking tool is required.

Besides being spark-proof and easily machined for refacing, aluminum is not brittle and does not chip. In comparison with other materials frequently used in replaceable face hammers, aluminum is tougher and more endur-

ing than leather or plastics, and withstands impacts better than copper or babbitt. At the same time, it has the important quality of absorbing shocks, thereby minimizing operator fatigue and it absorbs metal chips because of its lasting softness.

When worn, heads or faces of aluminum are readily cut, turned or ground for longer use. In addition, the exclusive split jaw design of the Basa Hammer head further assists quick replacement of faces.

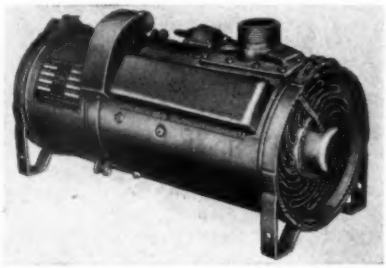
New Enclosed Combustion Heater

Manufacturer: The Herman Nelson Corporation, Moline, Ill.

Claims: New type gasoline burning heater known as Model AT-1000 Vehicle Heater is designed primarily for application to heating requirements in vehicles and other ground equipment, but serves equally well as a space heater for personal comfort or as a pre-heater for warming up various types of machinery preparatory to operation in very cold weather.

Although heat output is 20,000 BTU, the unit measures only 15" in length and the diameter of the outer shell is 6⅛". It weighs 17 pounds. Powered by an integrally designed fan and electric motor, it is claimed that a new low-pressure principle of combustion results in a minimum of current drain on the vehicle's battery.

Installation requires only a supply of fuel and a source of electricity.



Operation is fully automatic, being controlled by a simple on-off switch. The heater fan can also be operated to provide unheated, ventilating air when desired.

Models are available for six, 12 and 24 volts, d.c. Present production is devoted to various special applications for the armed forces.

Wood and Textile Preservative

Manufacturer: Quigley Company, Inc., 527 Fifth Ave., New York 17, N. Y.

Claims: Seals wood and textiles against rot, decay, mildew and insects. Provides long term protection at low cost for both interior and exterior wooden structures. The preservative can be applied by brush, spray, dipping or pressure impregnation. It is non-poisonous to humans, will not irritate the eyes, does not induce dermatitis, leach out, or increase fire risk. The preservative comes ready to use and requires no heating.

It is claimed that in damp or underground locations the preservative protects against, wood devouring insects such as termites, ants, and others, and also acts as a fungicide that exterminates wood consuming molds.

In the excavating and construction fields the preservative can be used on heavy timber construction such as mine timbers, piling, trestles, poles, posts, etc. It also offers effective protection to heavy fabrics such as cotton duck, burlap and rope.

Postwar Road Program

(Continued from page 72)

posed projects submitted by the state highway departments for approval and the eventual expenditure of their share of the $500,000,000. The Act provides that this money is to be available for the making of surveys and plans, acquisition of rights-of-way and for postwar construction.

The program is to be administered under the Public Roads Administration's long-standing policy of cooperation with the states. The state highway departments are responsible for initiating projects, preparing plans, letting contracts and supervising construction, each step subject to the approval of Public Roads Administration. Under the law, the Public Roads Administration can enter into agreements for expenditure of a state's share of the Federal-aid funds only with the state highway department.

The chief purpose of the new legislation is to provide national networks of main and secondary highways and catch up with road work which normally would have been done if the war had not curtailed the use of materials and manpower, MacDonald emphasized. He pointed out that postwar employment is also a primary objective and that it is necessary to have these road projects blueprinted down to the contract stage in order that men can be put to work as soon as the war ends.

Some economists have assumed that the wage and price conditions that are likely to exist immediately after hostilities cease may approximate those that prevailed in 1940-41. If this proves correct, highway construction should provide about 19,350 man-years of direct, and 43,120 man-years of indirect employment for each $100,000,000 expended.

No. 123 CRUSADER

No. 763 PONY SEAT

You may never have thought of it in just these terms . . . but it is a fact that SEAT FAG is an important work-loss factor among operators of mobile equipment. At a time when manpower is at a premium, with rigid construction schedules to be met without delay, you can't afford to risk efficiency losses resulting from this easily corrected cause.

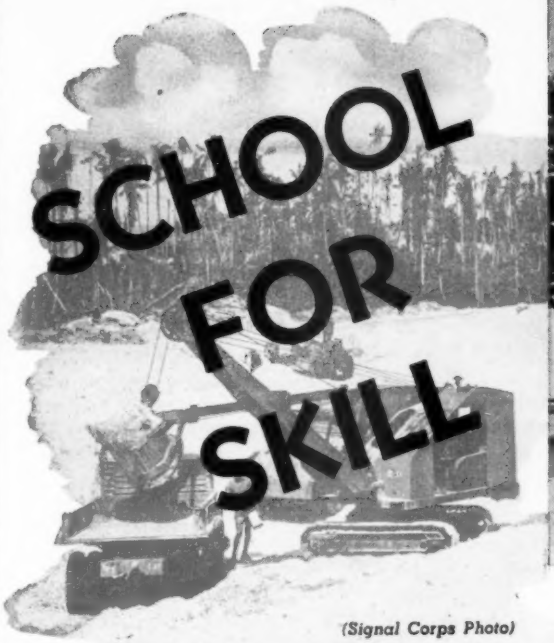
More and more manufacturers of tractors, contracting and industrial equipment are reducing SEAT FAG work-loss by equipping their machine with MILSCO CUSHION SEATS. It will pay you to specify Milsco Cushion Seats on your equipment.

Our Milsco Victory Line Seat Cushions, now available, will add much to the riding comfort and efficiency of your operators. Write for descriptive literature and price list. DISTRIBUTORS: Contact us *now* regarding unassigned territory.

MILSCO MANUFACTURING COMPANY
2758-G North 33rd Street • Milwaukee 10, Wisconsin

Milsco MILWAUKEE Cushion Seats FOR FARM AND INDUSTRIAL EQUIPMENT

SCHOOL FOR SKILL



(Signal Corps Photo)

SOUTH PACIFIC—A [illegible] unloads a [illegible]
(Navy Photo)

The men who are doing such an effective job of using today's fine excavators as weapons against the Axis, will be ready to apply their war-developed skill to the operation of tomorrow's better machines. The combination will make excavating a vital factor in building a **better** peacetime world.

As in war, Bucyrus-Eries, operated by war-trained men, will produce outstanding results on your postwar work.

V-68C

ADAK—A 15-B crane erects a hangar.
(Official Navy Photo)

ALGIERS—A 10-B dragline widens a drainage ditch.
(Signal Corps Photo)

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

ALEUTIANS—A 15-B crane unloads supplies.
(Official Navy Photo)

NOT in the *Contract*

"I want an E string for my violin," said the GI in a London music store.

The girl clerk ducked behind the counter and came up with all the violin strings in the shop.

"Pick it hout yerself," said she. "I carn't tell the blinkin' 'e's from the she's."

Sergeant: "Sambo, this is your sentry post. Stay right here and if anything moves, you shoot."

Sambo: "Yassuh, boss, and if anything shoots I move."

Vacationist: "Any big men born here?"

Native: "Nope. Not very progressive 'round here; best we kin do is babies. Diff'rent in the city, I spose."

As a colored doorman ran down to open the limousine door, he tripped and rolled down the last four steps.

"For heaven's sake, be careful," cried the club manager. "They'll think you're one of our members."

A widow is a fortunate woman. She knows all about men and the men who know anything about her are dead.

"How old are you little girl?" asked the bus driver.

"If you don't mind, big boy, I'll pay full fare and keep my statistics to myself."

A furious man dashed into a newspaper office. He was a local celebrity and had been reported as present at a boxing match.

"You referred to me as the 'well-known lightweight champion'," he roared.

"Well—" said the editor.

"And I'm not. That's my brother. I'm the coal dealer."

"I thought I saw you taking a gentleman to your room last night, Miss Jones," said the stern landlady.

"Yeah. That's what I thought, too."

Landlady: "Go and never darken my bath tub again."

Draftsman: "Well, I had to draw the line somewhere."

Prosecuting Attorney: "You say that when you visited the nudist colony on the night of the murder, you didn't do a thing while there. Don't you realize you are under oath?"

Old Fellow: "Sure, I'm under oath, but I'm also over eighty."

Guest: "Look here! How long must I wait for the half portion of duck I ordered?"

Waiter: "Till somebody orders the other half. We can't go out and kill half a duck."

"Brothers," said the colored preacher, "the subject of mah sermon today is liars. How many in dis congregation have read the sixty-ninth chapter of Matthew?" Nearly every hand went up.

"You is the people ah wants to preach to," the reverend said. "Dere is no such chapter."

A Washington hotel clerk told the three SPARS he was sorry no rooms were available, but if they didn't mind sharing a room with three sailors it might be arranged. Later three WAVES came in and again the accommodating sailors agreed. To add to the clerk's distress a helpless but beautiful blond appealed for shelter. The sailors again proved their hospitality. . . . The next morning the three sailors came into the breakfast room and each ordered a doughnut and a cup of coffee. They were soon followed by the SPARS and then the WAVES — each ordering doughnuts and coffee. Finally the blonde appeared, evidently rested, and ordered a doughnut and a cup of tea. . . . It just goes to show that nine people out of ten drink coffee for breakfast.

Grogan and McSworley were just about finishing their cigars as they entered Clancey's home on a visit.

"Have you any place where we can put our butts?" asked McSworley.

"Phyllis," shouted Mrs. Clancey, "bring two chairs."

"Run get Gus to see if he can stop the whistling sound in the Motor!"

ROEBLING

QUESTIONS AND ANSWERS

Q Why are three or more seizings recommended to hold the end of a rope when one would keep it from unraveling?

A **With non - preformed rope it is almost impossible to hold the strands sufficiently tight with one seizing. If rope lay is lost or if any of the strands is allowed to shift from its balanced relation with respect to the others, improper rope life will very likely result.**

Q Is it necessary to use seizings on a preformed rope?

A **It is not necessary to use seizings to keep preformed rope from unlaying because all wires and strands are set to their helical forms. However, it is advisable to use seizings to prevent the strands from being forcibly unlaid and distorted when cutting or handling the rope. Naturally, preformed rope must be seized when preparing it for socketing.**

YOU CAN'T TAKE WIRE ROPE FOR GRANTED!

"SPEED" will be the order of the day in postwar construction. That's why you can't take wire rope for granted! ... why you can't depend on "just as good" rope for shovels or cranes or draglines.

And that's why you need *tough* Roebling "Blue Center" Wire Rope for *tough*, excavating and construction jobs! Its proven stamina to deliver long service ... its engineering — both in our plant and on your job — assures economical operation by reducing costly shutdowns and expensive maintenance practices.

But find out for yourself how Roebling "Blue Center" Wire Rope fights fatigue and abrasion; how its extra strength and flexibility make it tops for all excavating and construction work ... as well as *all* general heavy-duty jobs.

And find out, too, how Roebling engineers can help you choose the *right* rope for *every* operation. A telephone call to our nearest branch office is the first step toward greater returns from your rope-rigged equipment. Why not make it today?

JOHN A. ROEBLING'S SONS COMPANY
TRENTON 2, NEW JERSEY
Branches and Warehouses in Principal Cities

WIRE ROPE AND STRAND • FITTINGS • SLINGS
ELECTRICAL WIRES AND CABLES • COLD ROLLED STRIP
WIRE CLOTH AND NETTING • SUSPENSION BRIDGES AND CABLES • HIGH AND LOW CARBON ACID AND BASIC OPEN HEARTH STEELS • ROUND AND SHAPED WIRE • AERIAL WIRE ROPE SYSTEMS • AIRCORD, SWAGED TERMINALS AND ASSEMBLIES

JR ROEBLING

PACEMAKER IN WIRE PRODUCTS

Notes from the manufacturers

Herman M. Brown Company of Des Moines, Iowa, announces that Paul J. Sullivan, formerly associated with Brandeis Machinery & Supply Company of Louisville, Kentucky, has been appointed general manager. Through an error it was reported in the last issue that Sullivan was now associated with the James W. Bell Company of Cedar Rapids, Iowa.

B. F. Goodrich Company of Akron, Ohio, is increasing production of its vinyl chloride resins by expansion of its Louisville, Ky., chemical plant, according to William S. Richardson, general manager of the Chemical Division. The expansion is scheduled for completion early in 1945.

Union Wire Rope Corporation of Kansas City, Mo., has been granted its fourth star to the Army-Navy "E" and because of its excellent record may retain the new pennant for a full year rather than the usual six months.

Caterpillar Tractor Co. of Peoria, Ill., announces the appointment of Kramer-Church Tractor Co., Ltd., Regina, Saskatchewan, Canada, to succeed Albert Olson Co., Ltd. Albert Olson, president, is retiring after representing Caterpillar Tractor for the past 20 years.

Pioneer Engineering Works, Minneapolis, Minn., has appointed the Martin-Roasa Tractor & Equipment Co., Cedar Rapids, Iowa, distributor for their products.

Davey Compressor Company of Kent, Ohio, announces the addition of General Machinery and Equipment Co., Inc., 801-15 Woodland Avenue, Kansas City 6, Missouri, as a new franchise dealer. General Machinery and Equipment Co. is headed by Carl E. Jensen.

M-R-S Manufacturing Company, Jackson, Miss., through L. R. Simmons, general manager, has announced plans to double production of Mississippi Wagons in 1945 due to increased demands for this equipment. C. H. King is general sales manager.

Independent Pneumatic Tool Company, Aurora, Ill., has received the resignation of W. H. Brewer, general manager, who is retiring due to failing health. Mr. Brewer became general manager last April after being works manager of the Thor main plant since December, 1940.

Barber-Greene Company, Aurora, Ill., announces the promotion of L. A. Larson, formerly District Manager out of Milwaukee to an Area Manager position. District representatives appointed are Brebner-Sinz Machinery Co., Inc., Green Bay, Wis., and Marquette, Mich.; Milwaukee Power Equipment Co., Milwaukee, Wis.; Stone Mfg. Co., Milwaukee; Miller, Bradford and Risberg Company, Eau Claire, Wis.; Wm. H. Ziegler Co., Minneapolis, Minn.; Gibbs - Cook Equipment Co., Des Moines, Iowa; and Gierke-Robinson Co., Davenport, Iowa.

American Steel Dredge Company, Fort Wayne, Ind., will produce hydraulic, dipper and clam-shell dredges of standardized design as soon as present committments on barges for the Army will permit, Walter W. Walb, General Manager of the company has announced.

Worthington Pump and Machinery Corp., Harrison, N. J., at its December Board of Directors meeting elected Clarence E. Searle president to succeed Harry C. Beaver who was elected vice chairman of the Board of Directors and chairman of the Management Committee. Mr. Beaver was president since 1931 and Mr. Searle vice president in charge of sales since 1932. Hobart C. Ramsey was elected executive vice president, Edwin J. Schwanhausser vice president in charge of sales, and Leslie C. Ricketts a vice president.

Shunk
GRADER AND SCARIFIER BLADES
For any type or make of machine—Motor Graders, Maintainers, Scrapers, Drags, Bulldozers, Backfillers, Wagon Scrapers, Trail Builders, Trail Blazers, Carryalls, Snow Plows. Also—
CUTTING EDGES. WEARING BOOTS. BACK SLOPERS. EXTENSION BLADES. MOLDBOARDS and SCARIFIER TEETH
50 years of specializing in the manufacture of Construction Equipment Blades has developed for your benefit a quality of special steel, milled through our own rolls and forged at the edges to give that extra cutting and wearing quality you need.
Furnished in various widths, lengths, and thicknesses, punched ready to fit your machine.
Consult your internationally recognized Blade Specialists. Write for special bulletins, giving type and name of machines you operate—get set for Blades early.
Shunk
MANUFACTURING COMPANY
Established 1834
BUCYRUS, OHIO
AEM
EQUIPMENT DISTRIBUTORS

HAYWARD BUCKETS
WON'T QUIT OR CAUSE TIME OUT
A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.
THE HAYWARD COMPANY
52-54 Church Street
New York, N. Y.

A Time-Saving ACCESSORY
Bulldog ROPE SOCKETS never fail. The harder the pull . . . the tighter the grip! Attachment is easy and quick and directly in line with pull, eliminating costly kinks. Made in dozen sizes and four different styles.
T34C
BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN

New trade literature

Title: **"Good Public Relations for the General Contractor".**

Subject: This manual on proper public relations should be in the hands of every general contractor. Prepared for contractors, it contains a public relations chart, sample advertisements, and project signs and posters. Numerous examples are given on how public goodwill can be merited, attained, and kept. Shows that it is a business asset for a contractor to obtain goodwill through a straight-forward, honest and considerate dealing with everyone with whom he comes in contact in his operations. Printed in three colors, illustrated with sketches, 24 pages.

Where to Get: Associated General Contractors of America, Inc. News Bureau, 10 Rockefeller Plaza, New York 20, New York. (Free)

Title: **"Suggestions and Useful Data For Those Modern Roads You Are Planning".**

Subject: A folder that catalogs briefly the problems confronting engineers and officials in connection with postwar plans and construction. How to meet these problems is described and illustrated and other available literature is listed.

Where to Get: Armco Drainage Products Association, Middletown, Ohio. (Free)

Title: **"Onan Electric Generating Plants (690)".**

Subject: The excavator or contractor who must supply his own electricity in the field will find this folder of great value. It discusses and illustrates electric generating plants, considers the advantages and disadvantages of alternating and direct current generators, and offers other very important data of interest.

Where to Get: D. W. Onan & Sons, 39 to 51 Royalston Avenue, Minneapolis 5, Minnesota. (Free)

Title: **"Operators Handbook".**

Subject: Truck and scraper operators, excavating and other contractors, and all other users of commercial tires find this 96-page booklet filled with the valuable tire information always wanted. The pocket size booklet includes a section dealing with the eight factors affecting tire life, discusses conditions which are found in truck operations and what to do to correct faults which are wasting tire miles. A chapter is devoted to synthetic tubes, while other chapters deal with rims and wheels, maintenance of tires, and obtaining the lowest possible cost per tire mile by selecting the right tire for the right job.

Where to Get: The B. F. Goodrich Company, Akron, Ohio. (Free)

Title: **"Progress Pointers No. 3"**

Subject: Maintenance and repair work on highways and streets not requiring L-41-e authorization are listed in this eight-page illustrated pamphlet. Also includes regulations governing new construction and procedure for figuring construction cost.

Where to Get: The Asphalt Institute, 801 2nd Ave., New York 17, N. Y. (Free)

Title: **"A Guide for Your Postwar Equipment Buying"**

Subject: Asks and answers five questions pertinent to postwar construction equipment. Profusely illustrated, it quotes facts pertaining to the past decade.

Where to Get: R. G. LeTourneau, Inc., Peoria, Ill. (Free)

Title: **"The Theory of Soldering, Brazing and Low Temperature Welding"**

Subject: This leaflet tells how the Eutectic process was discovered and explains what happens when the alloy is deposited on the parent metal at low temperatures. Offers various definitions and applications relevant to this process.

Where to Get: Engineering Department, Room 1113, Eutectic Welding Alloys Company, 40 Worth St., New York 13, New York. (Free)

Title: **"Marlow Pumps Catalogue P43"**

Subject: Probably the most complete and comprehensive publication on centrifugal, diaphragm and plunger pumps. Discusses advantages and disadvantages of each type. Also includes 18 pages of engineering data.

Where to Get: Marlow Pumps, Ridgewood, N. J. (Free)

Title: **"Rechargeable Storage Battery".**

Subject: The development of the new rechargable wet storage battery is outlined in this six-page catalog section bulletin. Illustrated are the charging units in connection with the battery, testers, and testing methods. The bulletin shows that wet batteries outlast dry cells and in one test showed a yearly saving of $3,960.00 by using 575 batteries in 375 flashlights. Nine questions and answers, and a table of descriptions are included.

Where to Get: The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio. (Free)

Title: **"The Chain Hoist of Tomorrow, Today, and Yesterday".**

Subject: An attractive, large size 12-page bulletin describing the line of chain hoists and trolleys manufactured by the Chester Manufacturing Company. A section "The Care & Use" of this equipment will be found of interest to all users of this type of equipment.

Where to Get: Chester Manufacturing Company, Lisbon, Ohio. (Free)

TO ADVERTISE: All advertising in this section is payable in advance. Rate: 60c per line, or $7.20 per inch of 12 lines. Minimum charge $2.40. No discounts; no commissions. If no change in copy is desired, three continuous insertions are offered for the price of two. Read these instructions carefully. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Count your own copy to save delay. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January issue closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

FOR SALE

Bucyrus-Erie 225-B steam shovel. Located North Dakota. Write to Baukol Noonan Lignite, Inc., Noonan, North Dakota.

TWO 50-B STEAM SHOVELS, CATERPILLAR TRACTION, 30 FOOT BOOM, 19 FOOT HANDLE, 1½ YARD DIPPER.

Both machines are in good working condition. For further information write or phone to—

CENTRAL IRON LIQUIDATING CO., GILES
P. O. Woodstock, Ala.
Tel. Giles No. 1

Model 5161 Electric Shovel, 45' boom, 29'-6" handle, 4 yard dipper, caterpillar mounting, 2300 volt, 3 phase, 60 cycle. Location Middle West. Available now. Box 3081

FOR SALE

One Model 78-C Standard Railroad Shovel with 3½ cu. yd. dipper, condition excellent.
Box 3074

Buy U. S. War Bonds and Stamps

FOR SALE—DRAGLINES, SHOVELS

1400 P&H Electric Dragline. 100′ boom, 4 yard bucket. Completely rebuilt.

Model 5120 Marion Electric Dragline with 100′ boom and 3 yard dragline bucket. Excellent condition.

1½ yard Osgood Combination diesel shovel and dragline.

¾ yard Osgood Commander Gasoline Shovel. Rebuilt.

FRANK SWABB EQUIPMENT CO.
Hazleton, Pa.
Telephone 3906

HELP WANTED

WANTED
INDUSTRIAL SAND PLANT SUPT. Give birth date, schooling, experience, salary expected. Box No. 9235

WANTED
MAINTENANCE MAN. Steady Work. Good postwar opportunities. Write full experience with engines, motors, diesels, shovels, tractors, etc. to Box No. 9234.

DRILLERS FOR OVERSEAS
Experienced cable tool operators for New York firm. $2.04 per hr., time-and-half for over 48 hrs. Living Costs $50 per month. Age limit 45. Physical examination and draft board approval required. Box 9239

POSITIONS WANTED

ALL-AROUND OPERATOR
Can operate any kind of shovel, dragline, crane or clamshell—steam, diesel, gas or electric. Can do own repair work. Experienced in quarry, ore and coal stripping. Prefer quarry or coal stripping. Familiar with grading work. Will go anywhere. Have release. Box 9236

SHOVEL MECHANIC
Experienced mechanic. Worked as foreman on field repairs for 120-B Bucyrus-Erie electric shovels and Bucyrus-Erie electric blast hole drills, Diesel engine experience in maintenance of power plant. Prefer work on Bucyrus-Erie electric shovels. Age 51; good health; two dependents; can furnish references. Box 9237

12 years' experience as runner and oiler in open pit coal mine on 750-B. Age 42; good health; three children; draft classification 3-AH. Now available. Can furnish references. Box 9238

WANTED
1¼-yd. gas or diesel shovel-dragline.
Box 3082

Rear end mounted winch for wide gauge International TracTracTor Model TD-35. Should have a line pull up to 20,000 lbs. and carry up to 500 ft. of ¾″ line. Single speed acceptable, but must have reverse. Please give full details and price.
The F. J. Berry Co.
Rochester New Hampshire

FOR RENT

One Galion No. 101 Motor Patrol 12′ blade A1 condition; also TD-20 International cat. George Riemer, 2900 Armitage Ave., Chicago 47, Ill. Humboldt 5148.

DRAGLINE BUCKET FOR SALE
Bucyrus-Erie 3 cu. yd. Type AY heavy duty dragline bucket complete, almost new, $1500.
Box 626 Emporia, Kansas

SHOVEL BUCKET AND BOOM FOR SALE
Bucyrus-Erie 1¾ yard heavy duty bucket, one 30-foot boom, and two dipper sticks 19 feet, for 50-B steam shovel fitting, for sale at very low price.
CENTRAL IRON LIQUIDATING COMPANY
GILES, P.O. WOODSTOCK, ALABAMA

SURPLUS DIPPERS FOR BUCYRUS-ERIE SHOVELS

2—⅜ cu. yd. Skimmer Scoop Dipper—10-B.
2—½ cu. yd. Drag Shovel Dipper—17-B.
3—½ cu. yd. Skimmer Scoop Dipper—17-B.
1—¾ cu. yd. Welded Dipper—21-B.
1—1 cu. yd. Drag Shovel Dipper—29-B.
1—1¼ cu. yd. Cast Front Dipper—GA-3.
1—1¼ cu. yd. Drag Shovel Dipper—33-B.
1—1½ cu. yd. Heavy Duty All Cast Dipper—42-B.
1—1½ cu. yd. Snow Loading Dipper—10-B.
1—2 cu. yd. Rock Dipper—75-B.
1—2¼ cu. yd. Inserted Type Dipper—50-B.
1—2¼ cu. yd. Inserted Type—55-B.
1—2½ cu. yd. All Cast Dipper—55-B.
1—2¾ cu. yd. Light Duty Shovel Dipper—54-B.
1—3½ cu. yd. Coal Loading Dipper—75-B.
1—4 cu. yd. Type IV Medium Duty Dipper—100-B.

F.O.B. Works

Write for any further information desired.

BUCYRUS-ERIE COMPANY
Parts Department
South Milwaukee Wisconsin

1—Cletrac crawler and end loader.
1—Barber-Greene loader.
1—½-yd. Page dragline bucket.
Box 3083

Plymouth and Milwaukee gas locomotives, 8, 12, 25 tons, 36″ and std. ga., A-1.
Davenport, Porter, Vulcan 17 to 19-ton stream 36″ gauge S/T locomotives (4), rebuilt.
Vulcan 18-ton steam S/T locomotive, 42″ ga.
Porter 52-ton steam S/T locomotives, std. ga.
Bucyrus 50-B and 80-B steam crawler shovels.
Bucyrus-Erie 4-yd. electric shovel, 120-B.
Page No. 411 Diesel 2-yd. dragline, 65′ boom.
Monighan Walker draglines, 3-yd., Diesel, elec.
American steam railroad ditcher-crane, 28′ bm.
Gyratory crushers, 12″, 27″; and 7″ Newhouse.
Pioneer 300W portable gravel washing plant.
Euclid 6-yd. bottom dump crawler wagons (8).
Buckeye Model 203 trench excavator.
Hydroelectric plant, 1000 HP, 60′ head, a.c.
Fairbanks-Morse 210 HP Diesel engine.
Bucyrus 30′ shovel boom only, for 50-B machine.
Boiler tubes, 236—1¾″x5′, ferrules, (new).

H. Y. SMITH CO.
828 N. Broadway Milwaukee 2, Wis.

Cletrac tractor Model D.D. with Heil bulldozer H.T. 60 with Hercules Diesel motor; one Cat. R-4 tractor with bulldozer, semi-diesel with Hyster winch; one Cat. diesel Motor Patrol No. 11; one 8-yd. Austin-Western carryall; one drum Jaeger hoist with 4 cyl. Hercules engine; parts for No. 10 Caterpillar gas patrol; large stock of tractor parts for A.C.; Cletracs, International & Caterpillar; also four G.M.C. diesel motors No. 671; also bulldozer blades of all kinds.
Write Sam, 897 Adamson St., S.W., Atlanta, Ga.

2—Caterpillar Diesel Electric Sets, 17-85S with D-17000 Engine, 220-440 volt, A.C. 60 cycle, 3 phase, self regulating generators. (Practically new)
1—200 H.P. 220-440 volt, 60 cycle, 3 phase, slipring motor with grids.
1—75 H.P. 750 R.P.M. 220-440 volt, 60 cycle, 3 phase slipring motor with grids, drum switch and relay.
1—100 H.P. 865 R.P.M. 440 volt, 60 cycle, 3 phase, slipring with grids, drum, switch and relay.
1—15 H.P. 1745 R.P.M. 220-440 volt, 60 cycle, 3 phase, ball bearing induction motor with cross line magnetic starter. (New)
1—7½ H.P. fully enclosed, fan cooled, ball bearing induction motor, 220-440 volt, 60 cycle, 3 phase.
1—75 H.P. 900 R.P.M. 220-440 volt, 60 cycle, 3 phase induction motor with starter.
1—445 cu. ft. Worthington electric compressor, 2 stage.
300′ 8″ black pipe.
200′ 600 Volt—400 AMP. 3 wire rubber covered cable.
200′ 600 Volt—200 AMP. 3 wire rubber covered cable.
900′ 600 Volt—200 AMP. single copper cable.
Box 3085

Welding and Cutting Outfits, Torches, Regulators and Gauges, for heavy, medium and light welding and cutting. Superior Oxy-Acetylene Machine Co., Hamilton, Ohio.

FOR SALE
Two 6-cu. yd. AY dragline buckets. Used but short time. In excellent condition and ready for immediate use. Located in Southwest. Box 3080

FOR SALE
ALL OR IN PART
SAND AND GRAVEL PLANT INCLUDING JAW CRUSHER, GYRATORY CRUSHER, CONVEYORS, VIBRATING SCREENS, SAND CLASSIFIERS, EXTRA HEAVY SCRUBBER, WATER PUMPS, SAND PUMPS, FEED-O-WEIGHTS, WEIGHTOMETERS, TRESLE AND TRIPPER AND AUXILIARY EQUIPMENT.
ALSO
APPROXIMATELY 9 MILES OF CONVEYOR COMPLETE WITH BELTING, PULLEYS, TROUGHING AND RETURN IDLERS AND DRIVE EQUIPMENT.
ALL OFFERED SUBJECT TO PRIOR SALE.
FOR PARTICULARS WRITE
COLUMBIA CONSTRUCTION CO., INC.
BOX 579, REDDING, CALIFORNIA
TELEPHONE—REDDING 1440

Page scraper bucket No. 8; 1793 Type M; capacity ¾-yd. Also dragline lead for Manitowoc crane.
G. M. Jenswald
R.R. No. 3
Cassapolis, Michigan

Electrical equipment for Bucyrus-Erie 10-B consisting of 220 Volt, 60 cycle, 3 phase, 20 h.p. motor, control equipment and approximately 400′ of power cable priced to sell.
Box 3079

FOR SALE
34′ boom for 50-B steam shovel complete with engine, also 26′ handle, 2 yard rock dipper and 1½ yard dirt dipper. Box 3084

3 Million tons No. 7 strip coal available. Average 40′ overburden, 5′ coal. Truck and rail loading sites ideal.
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DRAGLINE BUCKET
1—1¼ cu. yd. Type AY Heavy Duty Dragline Bucket.
BUCYRUS-ERIE COMPANY
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